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REPORT

OF THE

Indian Tariff Board

ON THE

SUGAR INDUSTRY

(REPRINT)

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DELHI: MANAGER OF PUBLICATIONS
1933

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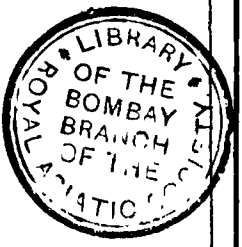

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PRELIMINARY.

The enquiry into the Sugar Industry was referred to the Tariff Board under the Government of India, Commerce Department's Resolution No. 127-T. (19), dated 20th May, 1930, which runs as follows:—

"At the beginning of the current year the import duties on sugar were as follows:—

23 Dutch Standard and above . . .	Rs. 4-8 per cwt.
Inferior to 23 Dutch Standard but not inferior to 8 Dutch Standard . .	Rs. 4-0 per cwt.
Below 8 Dutch Standard, molasses and sugar candy	25 per cent. *ad valorem*.

The Finance Act of 1930 enhanced these duties, for revenue purposes, by Re. 1-8 per cwt. in each case. During the last session of the Legislature the Government of India received a representation from the Imperial Council of Agricultural Research, which stated that in March, 1929, the Government of India had addressed all Local Governments on the subject of the sugar industry, and that on receipt of replies to this letter the whole question had been examined by a specially qualified Committee appointed by the Imperial Council of Agricultural Research. This Committee's report had been considered by the Council, which resolved that the Government of India be asked to refer to the Tariff Board for enquiry the question whether protection is required, and if so, in what measure, for the sugar industry in India. In making this application the Imperial Council of Agricultural Research had taken into consideration the fact that the three Provincial Governments most vitally interested in the sugar industry, namely, the United Provinces, the Punjab and Bihar and Orissa, together with the Government of Bombay, had asked for an enquiry by the Tariff Board.

"2. The question whether a *primâ facie* case has been established for reference to the Tariff Board of the desirability of granting protection to the sugar industry has been carefully examined by the Imperial Council of Agricultural Research, and the Government of India after considering the evidence adduced by the Council have decided to refer this question immediately to the Tariff Board for enquiry.

"3. In making its enquiry the Tariff Board will be guided by the principles laid down in the Resolution adopted by the Legislative Assembly on the 16th February 1923, and will consider—

(*i*) whether the conditions laid down in paragraph 97 of the Report of the Indian Fiscal Commission are satisfied in the case of the sugar industry, in which term is intended to be included the grower of sugarcane in India, the manufacturer of *gur*, including rab, jaggery and all other indigenous forms of raw sugar, and the manufacturer of crystalline sugar,

(*ii*) to what extent, if any, and in respect of what classes or descriptions of sugar, protection should be afforded, and

(*iii*) how its recommendations, if any, will affect industries using any sugarcane products.

" 4. Firms or persons interested, who desire that their views should be considered by the Tariff Board, should address their representations to the Secretary to the Board."

The Board issued a Press Communiqué, dated 13th June, 1930, in the following terms:—

" The attention of all those interested is invited to the resolution of the Government of India in the Commerce Department, No. 127-T. (19) of 20th May, 1930, in which the Tariff Board has been directed to hold an enquiry into the question whether protection is required for the Sugar industry in India. The Board proposes to take up this enquiry at once and those firms and persons who desire that their views should be considered by the Board are requested to forward their representations (with five spare copies) to the Secretary so as to reach the Board's tour office in Ootacamund not later than the 15th July."

As will be seen from the terms of the resolution the principal applicants were the Imperial Council of Agricultural Research and four Provincial Governments, namely, Bombay, United Provinces, Punjab and Bihar and Orissa. At a later stage a representation was also received from the Government of Bengal through the Government of India. The Board issued four questionnaires in all as follows:—

Questionnaires.

(*i*) for Local Governments,

(*ii*) for Manufacturers,

(*iii*) for Importers,

(*iv*) for *Gur* Merchants.

Replies were received from all Local Governments, but the Government of Bombay in their letter No. 6479/D, dated 25th/28th July, 1930, which contained a general representation on the subject, stated that they reserved their considered opinion regarding the necessity for the protection of the Sugar Industry until the Tariff Board's report was before them. The replies to the questionnaire and the evidence of officers serving under the Government of Bombay must, therefore, be considered as having been given by them in their private capacity only and not as representing the views of the local Government. Similarly the Government of Bengal, when forwarding written replies compiled by their officers, stated that the replies did not embody the views of the local Government and in giving permission for the Director of Agriculture and his assistants to appear before the Board they explained that they were not authorised to speak definitely on behalf of Government. Since the Governments themselves are the principal applicants in this case we should have welcomed a more authoritative

expression of their opinion before the Board. The Governments of Bihar and Orissa, United Provinces, Punjab and Bengal were officially represented in evidence and we wish to record our sense of obligation to the Hon'ble Sir Jogendra Singh, Minister for Agriculture, Punjab, who appeared and gave evidence before us at Delhi. We also wish to express our thanks to the Directors of Agriculture and other officials who afforded us great assistance in the course of our enquiry. We also had the advantage of examining Mr. B. C. Burt, C.I.E., on behalf of the Imperial Council of Agricultural Research and Mr. R. C. Srivastava, the Sugar Technologist to the Imperial Council.

A representation was received from the Indian Sugar Producers' Association, Cawnpore, as well as replies from a number of individual factories belonging to the Association, from Cane Growers' representatives in Bombay and Bihar and Orissa and from merchants and importers. Several of the companies supplied us with full information regarding their costs. Of this we have made the fullest use in estimating a fair selling price for the Indian industry. Since the information was supplied confidentially, the names of the different factories concerned have not been given. In addition a large volume of valuable statistical information was placed at our disposal by Mr. Wynne Sayer, Secretary of the Sugar Bureau at Pusa, to whom our thanks are also due for having arranged our visits to various factories.

The Board's tour programme in outline is shown below:—

Tour and witnesses.

1930.

June, 28th	Visit Coimbatore Cane Breeding Station.
July, 1st	Visit Nellikuppam Factory.
,, 23rd	Arrived Bombay.
August, 30th	Visit Surat (Gold Thread Enquiry).
September, 3rd	Arrived Bombay.
,, 5th	Visit Belapur.
,, 9th	Visit Manjri Farm, Poona.
,, 10th	Arrived Bombay.
,, 17th	Arrived Calcutta.
October, 4th	Visit Jamshedpur (Steel enquiry).
,, 18th	Arrived Calcutta.
,, 21st	Arrived Pusa.
,, 27th	Arrived Cawnpore.

November, 5th . . .	Arrived Delhi.
,, 14th . . .	Visit Sonepat.
,, 16th . . .	Arrived Shahjahanpur.
	Visit Rosa Factory.
	Visit Agricultural Farm.
,, 19th . . .	Arrived Bareilly.
	Visit Pilibhit Factories.
,, 23rd . . .	Arrived Pusa.
	Visit Samastipur Factory.
	Visit Daulatpur Farm.
	Visit Bara Chakia Factory.
	Visit Lohat Factory.
December, 9th . . .	Arrived Calcutta.
,, 18th . . .	Arrived Jamshedpur (Steel enquiry).

1931.

January, 1st	Arrived Bombay.

During its halt in Bombay in August and September, 1930, and its halt in Calcutta in September and October, 1930, the Board was engaged upon three other enquiries in addition to Sugar and again in December, 1930, a fourth additional enquiry necessitated a visit to Jamshedpur. In addition to the large volume of written evidence and representations received the Board examined orally between 50 and 60 witnesses and had the opportunity of seeing the conditions under which cane is grown in typical areas of Madras, Bombay, Bihar and Orissa, United Provinces and the Punjab.

Scope of the Report.

We are conscious throughout this report of the very close connection between the sugar industry and agricultural development. Since the raw material required by the industry is sugarcane, the cost of which is in present conditions nearly two-thirds of the cost of manufacturing sugar, it is clear that the future position of the industry must depend on the solution of problems mainly agricultural in their nature. Questions of this kind naturally fall outside the province of this Board. Though we have had occasion to touch on some of these matters in broad outline, we have endeavoured so far as possible to confine our attention to the question of the desirability of granting protection and the method, amount and duration of such protection. We have been impressed with the importance of arriving at an early decision on the problem of protection if serious depression in cane cultivation is to be avoided. On the agricultural side the subject is so wide that time has not permitted us to deal in detail with cane cultivation in all its aspects and we have not attempted to traverse the ground covered by the 1920 Sugar Com-

mittee's report. We believe the purpose of our enquiry will best be served by a detailed examination of the problems directly presented by our terms of reference, leaving the more technical aspects of the agricultural problems involved to those bodies and departments whose function it is to advise Government on such matters and to frame schemes for the better development of agriculture.

Report on the Sugar Industry.

CHAPTER I.

The World Position.

We propose to begin our report by a brief survey of the position of the Sugar industry throughout the world. The difficulties which have been experienced in recent years by the white sugar industry in India are to a large extent a reflection of the difficulties felt in the leading sugar producing countries of the world. It is therefore necessary for a proper comprehension of the sugar problem in India that world tendencies reacting on the sugar industry should be recognised. The outstanding factor to which the difficulties of the sugar manufacturer may be traced is the excess of production over consumption of sugar which has been so noticeable in recent years. This excess of production has been partly the legacy of the period which immediately followed the war when on account of the shortage of beet sugar during the war large areas of new land were brought under cane, especially in Cuba. With the subsequent revival of beet the increased supply of cane sugar thus brought into existence has exerted a steadily depressing effect on the market. Another important circumstance which has helped to create the present glut of sugar is the phenomenal success which has attended sugarcane breeding experiments, of which perhaps the most notable example is the success of the new variety of cane in Java, P. O. J. 2878, which has helped very largely to raise the yield of sugar in that country. Meanwhile the importance of promoting the production of sugar on agricultural grounds and also for reasons of national safety in times of war, which was a recognised feature in the economic policy of European countries before the war, has now recovered probably in full measure the hold which it had lost during the war. In addition to those countries which grew beet before the war, Great Britain now accounts for a production of very nearly 320,000 tons, while Russia has undertaken a programme for the extension of beet cultivation from 56,000 tons of sugar in the year 1921-22 to 2,690,000 tons in 1931-32. For similar reasons Japan has steadily pursued its policy of sugarcane development in Formosa where production now totals about 800,000 tons.

Causes of increase in production.

Figures of production.

2. The following are the figures of world production given by Gustav Mikusch. Details for 1927-28 are not available but the totals are given:—

A.—Beet Sugar.

(In 1,000 metric tons, raw value.)

	1927-28.	1928-29.	1929-30.	Estimate. 1930-31.
(a) *Europe*—				
Germany ...		1,864	1,985	2,460
Danzig ...		29	29	36
Czechoslovakia ...		1,057	1,035	1,180
Austria ...		107	120	145
Hungary ...		220	247	225
France ...		907	917	1,150
Belgium ...		279	252	270
Netherlands ...		321	265	300
Poland ...		747	917	735
Denmark ...		170	134	166
Sweden ...		161	121	181
Italy ...		387	435	411
Spain ...		239	248	320
Jugoslavia ...		129	121	95
Rumania ...		134	82	170
Bulgaria ...		29	40	51
Switzerland ...		7	7	7
United Kingdom ...		218	319	485
Irish Free State ...		22	23	25
Finland ...		3	3	3
Latvia ...		2	4	7
Turkey (European) ...		4	5	10
Azores ...		2	3	3
(b) *America*—				
United States ...		1,070	1,027	1,200
Canada ...		33	35	38
Argentine ...		...	1	1
(c) *Australia*—				
Victoria (Maffra) ...		2	2	2
(d) *Asia*—				
Japan (Hokkaido) ...		23	29	30
Korea ...		1	1	1
Turkey (Anatolia) ...		2	4	6
Total Beet Sugar production	9,142	9,594	9,332	11,713

B.—Cane.

(In 1,000 metric tons, raw value.)

	1927-28.	1928-29.	1929-30.	1930-31.
(*a*) *Europe*—				
Spain ...		17	19	28
(*b*) *North America*—				
Louisiana and Florida ...		126	205	210
Porto Rico ...		539	786	700
Hawaii ...		832	844	830
Virgin Islands ...		4	7	4
Cuba ...		5,240	4,746	3,627*
Trinidad ...		91	81	80
Barbados ...		67	86	66
Jamaica ...		59	69	55
Other British West Indies (Antigua, St. Kitts, Montserrat, St. Lucia, St. Vincent) ...		32	45	45
Martinique and Guadaloupe ...		50	68	65
Santo Domingo and Haiti ...		372	387	353
Mexico ...		183	214	235
Central America (Guatemala, Costarica, Honduras, Nicaragua San Salvador, Panama) ...		122	141	141
(*c*) *South America*—				
British Guiana ...		118	119	114
Dutch Guiana ...		18	19	19
Argentina ...		410	375	410
Brazil ...		988	850	700
Peru ...		375	422	400
Other South America (Venezuela, Colombia, Ecuador, Bolivia, Paraguay) ...		80	80	79
(*d*) *Asia*—				
British India ...		3,041	3,105	3,300
Java ...		3,163	3,115	3,173
Japan and Formosa ...		907	925	920
Philippine Islands ...		725	790	770
Other Asia (China, Indo-China) ...		279	220	220
(*e*) *Africa*—				
Egypt ...		109	90	100
Mauritius ...		274	244	220
Reunion ...		38	51	50
South African Union ...		267	271	350
Mozambique ...		91	78	75
Other Africa (Angola, Madeira, Madagascar, Kenya, Somaliland) ...		34	38	40

* Supposing that Cuba will restrict the output to 3,570,000 long tons=3,627,000 metric tons: otherwise 5,000,000 tons.

(In 1,000 metric tons, raw value.)

	1927-28.	1928-29.	1929-30.	1930-31.
(f) *Australia*—				
Queensland, New South Wales	...	546	547	523
Fiji Islands	...	89	91	102
Total cane sugar production	17,533	19,286	19,128	18,004
Total world sugar production	26,675	28,880	28,460	29,717

The production fell in 1929-30 as a result of the fall of some 500,000 tons in the Cuban crop owing to self-imposed restriction. Apart from this, production shows a steady increase. The estimate for 1930-31 is 29,717,000 metric tons against an output of 19,879,000 in 1913-14.

Figures of consumption.

3. In the meantime consumption has not increased at the same rate as production. The figures for consumption as given by Gustav Mikusch are as follows:—

(In 1,000 metric tons, raw sugar value.)

	1927-28.	1928-29.	1929-30.
Europe—			
Germany	1,623	1,693	1,654
Czechoslovakia	393	407	405
Austria	202	209	219
Hungary	113	116	114
Switzerland	167	172	173
France	971	1,020	1,043
Belgium	210	223	226
Netherlands	232	258	285
United Kingdom	2,051	2,129	2,004
Poland	386	411	385
Soviet Union‡	1,315	1,350*	1,100*
Denmark	183	198	186
Sweden	231	244	270
Italy	379	395	381
Spain	269	286	295
Other countries‡	907	927	945
Total Europe	9,632	10,038	9,685
Asia—			
China, Hongkong†	1,150	1,210	1,100*
British India	4,325	4,051	4,250*
Japan, Formosa	829	898	860*
Java	297	338	396
Other countries†§	610	568	583*
Total Asia	7,211	7,065	7,189

*Estimated. † Calendar year 1930, resp. 1929. ‡ The Asiatic territories of the Soviet Union and Turkey included. § Muscovados consumed in the Philippines not included.

(In 1,000 metric tons, raw sugar value.)

	1927-28.	1928-29.	1929-30.
Africa—			
Egypt	150	169	170
South African Union	169	182	185
Mauritius	6	6	6
Other countries†	361	467	469*
Total Africa	686	824	830
America—			
United States	5,983	6,564	6,302
Hawaii	19	20	20
Porto Rico, Virgin Islands	50	50	50
Cuba†	156	168	140*
Canada Newfoundland†	429	427	429*
British West Indies, Guiana†	32	47	46
French West Indies†	5	4	4
Haiti, San Domingo†	30	29	29
Mexico	190	192	198
Other countries in Central America†	83	92	92*
Argentina‡§	340	350	350
Brazil	800	825*	825*
Peru‡§	41	59	60
Other countries in South America†	274	310	310*
Total America	8,432	9,137	8,855
Australia—			
Australia (Continent)†	327	340*	350*
Other countries†	85	75	79*
Total Australia	412	415	429
World	26,373	27,479	26,988

There was thus an excess of consumption over production of 1,472,000 metric tons as against an excess in 1913-14 of well under 1 million metric tons.

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* Estimated. † Calendar year 1930, resp. 1929. ‡ Sugar of all grades. § Calendar year 1929, resp. 1928.

Dark sugar produced by primitive mills in Asia and South America not included in the above figures.

World stocks.

4. The following are the figures relating to world stocks as given by Gustav Mikusch. The table shows the movement of stocks in twelve European countries and in five countries outside Europe. The figures for the United States and Cuba are stated to be taken from the statistics of Messrs. Willet and Gray:—

STOCKS IN SELECTED COUNTRIES.

(Thousands of metric tons, raw value.)

	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.
Germany	158	69	82	184	250	229	232	326
Czechoslovakia	9	7	36	44	9	47	34	45*
Austria	...	1	5	2	1	3	7	13
Hungary	10	2	17	8	7	9	13	14
France	74	55	74	90	141	107	201	210
Belgium	26	15	35	25	27	46	69	61
Netherlands	16	11	16	72	27	40	100	76
United Kingdom	261	145	305	378	263	157	183	165*
Poland	6	17	...	20	4	14	31	104*
Italy	100	130	178	10	2	2	17	70
Spain	46	19	107	156	159	130	104	78
Sweden	5	15	27	80	63	81	119	111
Total Europe	711	486	882	1,069	953	865	1,110	1,273
Canada	55*	40*	50*	85	93	79	72	88
United States (all ports)	200	219	228	347	296	503	907	470
Cuba (ports and mills)	628	787	1,268	1,656	1,450	1,419	1,395	2,776
Java	...	...	...	22	24	7	10	148
Argentina	118	121	87	217	350	368	358	310*
Total	1,712	1,653	2,515	3,396	3,166	3,241	3,852	5,065.

In commenting on these figures Gustav Mikusch states that in addition to the increase in stocks of about 3,400,000 tons which they show for 1929-30 over 1923-24 he estimates a similar increase for the rest of the world of 900,000 tons, bringing the total increase to 4,300,000 tons.

World price position.

5. The world position regarding white sugar may be summarized as follows. Production now exceeds consumption by about a million and a half metric tons. This is larger than the estimated pre-war surplus by more than 500,000 tons. Apart from this the prolongation of the period of depression and the continued increase in output have brought about a steady fall in prices which has resulted in the

* Estimated.

accumulation of large stocks and particularly in the translation of invisible into visible stocks. When prices are falling as they have been during the last three years, the trader to minimise his risk of loss maintains stocks at the lowest possible limit. This has the effect of throwing on the hands of the producer large quantities of sugar. Either difficulties occur in financing such stocks or, if finance is available, early sales are desirable to avoid the accumulation of interest charges. In either case large quantities are pressed on a reluctant market with the result that prices rapidly fall, frequently to an unprofitable level. Of the visible stocks at present held Mikusch estimates that about half are normally invisible stocks, and with the return of confidence in the market resulting from a reasonable probability of price stability, it is probable that the stock position would much improve. This in itself might in favourable circumstances result in some improvement in price.

Tariffs in other countries.

6. The very acute depression which has recently prevailed in the sugar industry has been further accentuated by the tariff arrangements in force in various countries. It is therefore necessary to give some account of these. Generally speaking, tariff and protective legislation is more intimately connected with the beet sugar industry than with the cane sugar industry. Most cane sugar is produced where there is only a small home market and consequently has always had to face world competition. The manufacture of beet sugar has always been started primarily to meet a home demand and export of beet sugar is a development of subsequent growth. As a consequence the beet industry has always been heavily guarded and no beet sugar is now placed on the market except under some system of protection. All important cane sugar countries have also introduced protective duties but as most of them have but a small home market the question that is of importance is what treatment their products receive in the export markets.

In the United Kingdom the general duty on sugar ranges from 8-1½*d.* per cwt. or Rs. 4 per maund to 11-8*d.* per cwt. or Rs. 5-11-6 per maund according to the polarisation of the sugar. Sugar produced in the British Empire—notably at Mauritius and in the West Indies—is imported at preferential rates which are approximately 50 per cent. of the rates quoted above. In addition a subsidy amounting to 13 shillings per cwt. or Rs. 6-6 per maund is paid to home grown sugar, though this will be reduced to one-half the present amount in October 1931. The United Kingdom also levies an excise duty of 7-4½*d.* per cwt. or Rs. 3-10 per maund on home grown sugar.

In the United States of America the general duty is 2·50 cents per lb. or Rs. 5-11 per maund on raw sugar and 2·65 cents per lb. or Rs. 6-6 per maund on refined sugar. Cuba is allowed to import at 80 per cent. of the above rates bringing the duty payable on Cuban sugar down to 2 cents per lb. and Hawaii,

Porto Rico and the Philippines are allowed to import free of duty. No excise duty is levied but a drawback of 99 per cent. is allowed on sugar imported for refining or making confectionery, jams, sweet drinks, etc.

In Germany the duty is 32 marks per 100 kilos of refined sugar and 27 marks per 100 kilos of raw sugar, these figures corresponding to Rs. 7-13 and Rs. 6-9 per maund respectively. France has recently increased the duty to 140 francs per 100 kilos which is equivalent to Rs. 7-8 per cwt. and Spain has introduced a similar increase. Austria levies a duty of 2·57 cents per lb. roughly about Rs. 6 per maund. Australia has placed a complete embargo on foreign sugar. The Union of South Africa levies a basic duty of 4*s*. 6*d*. per 100 lbs. *plus* a suspended duty—now in operation—of 3*s*. 6*d*. per 100 lbs. making a total duty of 8 shillings per 100 lbs. equivalent to about Rs. 4-6-0 per maund. Anti-dumping duties can also be put into force against countries which export manufactured goods at more than 5 per cent. below the domestic price.

7. The above countries are taken as examples of the tariff arrangements in force throughout the world but special mention should be made of the programme for agricultural expansion in Russia. The sugar industry under the Soviet Government has been nationalised and a clearly defined programme of expansion has been laid down. The following table gives an idea of the results achieved so far:—

The Russian programme and probable further expansion.

Year.	No. of factories.	Area in 1,000 hectares.	Production in 1,000 tons raw sugar.
1921-22	110	217	56
1922-23	112	176	233
1923-24	120	247	419
1924-25	124	379	506
1925-26	144	523	1,188
1926-27	168	542	970
1927-28	168	670	1,494

The Soviet Republic's economic scheme provides for an expansion of beet cultivation to 1,037,000 hectares in 1932 and an output of sugar in the working season 1931-32 of 2,690,000 tons of white sugar. The latest estimates put the present season's Russian output at approximately 2,000,000 tons and there seems no strong reason why the above programme should not be fulfilled.

8. It has been shown that throughout the world in both producing and consuming countries of importance sugar is subject to heavy duties and in many cases is definitely a protected article either by a direct protective duty or by bounties or by preferential duties. The chief consuming countries such as the United States, the United

The free market.

Kingdom, France, Portugal and Canada obtain their sugar from their own or from related factories overseas either free of duty or at a considerable rebate and impose a high duty on sugar of foreign origin. Also all European countries place difficulties in the way of the importation of foreign sugar by imposing more or less high import duties and the same is true of Brazil, Peru, the Argentine, Japan, South Africa and elsewhere. Prinsen Geerligs estimates that at present, excluding home grown and protected or preferentially treated sugar the demand for sugar is about 5,339,000 metric tons. Even this demand is partially met by countries favourably situated geographically which thus hold a natural preferential position against other competitors. For example the Indian demand is almost entirely met by Java. Allowing for this Prinsen Geerligs would put the extent of the free market at 3,400,000 metric tons. It is clear that even a small excess in a world production which amounts to 28,000,000 metric tons, if forced on a restricted free market, may result in a completely disproportionate fall in prices.

Price stabilization schemes.

9. Since this enquiry commenced, the leading sugar producing countries of the world have entered into negotiations for the purpose of stabilising sugar prices. An international sugar conference was held in Brussels early in December, 1930. The following were the quotas of export proposed compared with the actual figures of export for the last five years.

	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	Proposed quota.
	(In thousands.)		(In thousands.)		(In thousands.)	
Cuba	4,958	4,619	4,008	3,729	4,667	3,570
Java	1,813	1,720	2,008	2,646	2,317	2,200
Czechoslovakia . .	1,080	708	787	666	600	590
Poland	266	231	167	313	452	320
Germany . . .	129	207	155	220	263	200
Belgium . . .	202	126	127	119	100	29
Hungary . . .	84	72	71	101	132	90

It is understood that these quotas were accepted by all countries save Germany. Subsequently it was proposed that the German allotment should be 500,000 tons in 1930-31, 350,000 tons in 1931-32 and 300,000 tons in the succeeding three years. It is reported that these proposals were accepted by German representatives and await ratification by German sugar interests. It it noticeable that the Soviet Republic is no party to these arrangements. With a present output of about 2 million tons of sugar which may increase in the near future, it is clear that the policy which may be pursued in Russia may have a disturbing effect on the success of these arrangements in stabilizing prices.

CHAPTER II.

The Indian Sugar Industry.

10. In the last Chapter we have surveyed the position of the Sugar Industry throughout the world. We propose now to deal with the present position of the Sugar Industry in India. The accompanying table shows the reported area under cane for each province from the year 1908-09. It will be seen at once that the situation so far as distribution of the crop among the different provinces is concerned is the same as when the Sugar Committee reported in 1920. The Committee then stated " Of the 2,718,000 acres which India has, on the average, devoted to cane during the past nine years no less than 2,034,000 acres or 75 per cent. have been provided by the three main provinces of Upper India, the United Provinces (50 per cent.), the Punjab (15 per cent.) and Bihar and Orissa (10 per cent.) ". The latest figures available show for the year 1928-29, a total acreage of 2,727,000 of which the United Provinces provided 1,357,000 acres (50 per cent.), the Punjab 411,000 acres (15 per cent.) and Bihar and Orissa 287,000 acres (11 per cent.), a total of 76 per cent.; while for 1929-30, out of a total of 2,486,000 acres the United Provinces provided 1,380,000 acres (55 per cent.), the Punjab 348,000 acres (14 per cent.) and Bihar and Orissa 281,000 acres (11 per cent.), a total of 80 per cent. The first forecast for the 1930-31 crop shows about the same statistical position. The highest area was recorded in 1923-24 (3,115,065 acres) and this figure was again closely approached in 1927-28 (3,103,000 acres). The methods of collecting crop area statistics vary in different provinces and are in many cases not such as to justify any great faith in the accuracy of their results. We feel therfore that it would be unsafe to draw any inference from comparatively small annual variations. Further local climatic and other conditions of which our information is necessarily incomplete have an immediate influence on a crop which is throughout India looked upon as a cash crop. At the same time it cannot be doubted that the rapid expansion in 1922-23

Area under cane.

Area under sugarcane in the various provinces.

—	1908-09.	1909-10.	1910-11.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
United Provinces	1,120,100	1,037,600	1,047,100	1,340,600	1,425,400	1,379,900	1,192,000	1,261,000	1,202,000	1,489,000
Punjab	365,700	403,800	387,900	284,800	367,000	410,900	366,000	347,000	414,000	503,000
Bihar and Orissa	...	..	...	263,000	266,100	262,800	266,000	262,000	278,000	263,000
Bengal	553,000	507,800	515,600	223,300	221,800	218,300	233,000	231,000	204,000	207,000
Bombay	92,800	89,200	83,400	94,700	79,400	91,400	90,000	106,000	115,000	130,000
Madras	90,200	87,600	94,900	107,700	98,800	83,600	74,000	95,000	114,000	127,000
Assam	...	...	...	36,600	35,900	37,900	38,000	37,000	35,000	37,000
North-West Frontier Province	27,500	30,000	32,700	31,500	30,000	31,700	32,000	31,000	30,000	31,000
Central Provinces and Berar	...	...	...	...	...	20,400	19,000	21,000	23,000	25,000
Burma	12,167	12,244	13,275	13,902	14,214	15,040	15,362	15,791	18,356	20,417
Mysore	33,256	34,972	40,510	44,404	41,555	41,018	34,217	32,287	36,141	44,328
Other Indian States	63,748	68,953	73,803	71,367	79,542	77,222	64,078	63,123	69,777	89,922
Total	2,358,471	2,272,169	2,289,188	2,511,873	2,659,711	2,670,180	2,423,657	2,502,201	2,539,274	2,966,667

—	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.
United Provinces . . .	1,544,000	1,414,000	1,285,678	1,152,255	1,349,000	1,543,902	1,291,097	1,419,000	1,613,000	1,585,000	1,357,000
Punjab . . .	474,000	482,000	457,900	389,000	506,000	491,000	396,000	398,000	455,000	505,000	411,000
Bihar and Orissa . . .	274,800	275,000	286 000	3 6,000	306,000	307,000	303,000	294,000	289,000	289,000	287,000
Bengal	219,000	218,000	219,000	221 000	201,000	202,000	206,000	215,000	201,000	209,000	196,000
Bombay	126,000	83,000	92,000	83,000	99,000	104,000	84,000	84,000	88,000	103,000	85,000
Madras	123,000	93,000	103,000	121,313	131,095	121,298	100,360	113,000	114,000	106,000	89,000
Assam	33,000	32,000	25,000	41,900	42,000	42,000	42,000	41,000	40,000	41,000	36,000
North-West Frontier Province .	37,000	34,000	36,000	34,000	39,000	43,000	41,000	48,000	53,000	43,000	48,000
Central Provinces and Berar .	30,000	19,000	20,000	17,000	19,000	22,000	22,000	23,000	23,000	23,000	23,000
Burma	20,378	21,794	25,550	35,032	31,542	28,483	23.462	23,276	...	...	...
Mysore	40,143	36,000	31,000	32,000	38,000	34,000	32,000	32,000	35,000	34,000	31,000
Other Indian States . . .	13,827	175,749	167 641	161,055	165,702	176,382	157,678	139,000	164.000	165,000	164,000
Total .	2,935,148	2,883,543	2,747,869	2,583,655	2,927,339	3,115,065	2,708,597	2,829,276	3,075,000	3,103,000	2,727,000

and 1923-24 was directly connected with the boom in sugar and *gur* prices which reached its peak in the year 1920-21. Of the big rise in 1926-27 and 1927-28 the United Provinces and the Punjab alone were responsible for an increase of over 250,000 acres. The Punjab Government have informed us that the rise there was due to high prices for *gur* ruling in the year 1925-26 and it is also noticeable that there was a fall in the price of cotton and a decrease in the area under that crop. The United Provinces Government in the course of their written replies to our questionnaire have stated that " except for a temporary rise in price in 1924 owing to low production, prices of *gur* have fallen steadily but the area does not seem to have been affected until the last two years. The fall in area during 1929-30 without a rise in price may be associated with increased imports of white sugar ". Nevertheless we notice in the figures supplied to us that the wholesale prices for *gur* in Cawnpore and Agra districts showed a distinct rise in the years 1925 and 1926 and we are inclined to the view that the rise in area must in some degree be attributed to this cause. The arithmetical average for the area under cane during the last twenty years works out at 2,840,000 acres. This is a slight increase over the average quoted by the Sugar Committee (2,718,000) but considering the fact that since that estimate was made there has been the unprecedented increase in prices of 1920-21 and the temporary increase in 1927-28 already referred to resulting in an increase in the acreage under cane in subsequent years, we think it reasonable to conclude that generally speaking there has been no permanent increase in the area under cane.

Relative position of the provinces.

11. We do not consider it necessary to make an elaborate review of the different provinces in the detail in which it was made by the Indian Sugar Committee of 1920 but shall confine ourselves to a brief comparison of conditions in the six most important sugar producing provinces, *viz.*, Madras, Bombay, Bengal, United Provinces, Bihar and Orissa and the Punjab. So far as the cost of production of cane is concerned we shall discuss these figures in greater detail in a later chapter and for the purpose of this review we take the final figures at which we have arrived.

Madras.—The Madras Presidency is entirely tropical and climatically is among the most favourable parts of India for cane cultivation. For 1929-30 the estimated yield of *gur* is 283,000 tons from 100,000 acres. Taking the average extraction of *gur* at 10 per cent. on cane this represents a yield of cane per acre of 28 tons, roughly equivalent to 775 maunds. The crop is in the ground on an average for ten to twelve months though in certain districts it is a 15 months crop. The East India Distilleries informed us that their working season was normally about 100 days or less. So far as the production of new varieties of cane is concerned Madras has practically not benefited by the Coimbatore Research Station, the experiments there being directed chiefly towards producing a cane suitable for sub-tropical climatic condi-

tions but there is no reason to suppose that the yield may not in time be largely increased and the working season extended by the introduction of improved canes. In spite, however, of these advantages; actual and potential, the sugarcane crop in Madras is comparatively unimportant. The Presidency has a traditional predilection for paddy on irrigated lands and the agriculturist is slow to change. In addition, the labour required on the waterlogged soil frequently used for paddy is extremely heavy and in Godavari and Vizagapatam districts, where a very large proportion of the crop is grown, heavy extra expense has to be incurred by protecting the cane with bamboo stakes against the violent cyclonic storms to which those districts are subject. The cost of production on the whole is estimated at from 7 to 12 annas a maund. Finally the average size of a holding in Madras is extremely small and the difficulties in the way of a sugar factory obtaining control over a sufficiently large area of cane are very great. It is true that the East India Distilleries and Sugar Factories, Limited, at Nellikuppam have an extensive system of leases but the control has only been obtained after many years work and at a cost of cane which appears to us abnormaliy high.

Bombay.—Like Madras, the Bombay Presidency (excluding Sind) is almost entirely tropical. It is capable of producing a higher yield of cane per acre perhaps than any other part of India and we were told at the Belapur Estate that in certain fields a yield of 40 tons or more had actually been realised. This represents over, 1,000 maunds an acre and compares favourably with the average yield obtained in Java. The actual average for this estate for the year 1929-30 was 24·69 tons or about 676 maunds. Higher yields have since been obtained. Experiments on the Government Agricultural Farm at Manjri have not so far shown that any improved cane is better than the indigenous Pundia cane but those experiments are conducted mainly in order to improve and cheapen *gur* manufacture. Actually at Belapur satisfactory results have been obtained from Co. 219 and E.K. 28. The cane crop normally takes 12 to 14 months to reach maturity. An ' adsali ' crop is also sometimes grown which takes 18 months, the object being to extend the working season. The working season may be taken as about 130 days. But in Bombay, as in Madras, the area under cane is small and the chief drawbacks are the cost of cane and the question of irrigation. A large sum has been spent on the Deccan Irrigation canals and consequently the irrigation dues are very heavy. The soil in the Deccan is also particularly liable to waterlogging and strict control by the public Works Department is found essential. We were told by cane growers that the crop is hampered by the regulations of the Irrigation Department and the fact is to some extent admitted by the Department. It is to be hoped that a satisfactory solution of the difficulties which the cultivator undoubtedly experiences in connection with cane cultivation may be evolved from the examination of the situation which we understand is now in progress. Large areas of cane should be available in the Deccan Canal area but

the *gur* made there is of a particularly superior quality and there is no guarantee that a new factory would obtain its cane supplies. Finally the cost of cane to the ordinary cultivator works out at about 12 annas a maund, a price which even with the high sucrose content of the cane must make the manufacture of white sugar uneconomic. It should be understood that the above statement does not apply to the Belapur Company which grows its own cane.

Bengal.—Bengal lies almost entirely outside the tropics and climatically is not fitted for such heavy yields of cane as Bombay and Madras. Until recently cane has not been a crop of first class importance in Bengal but we understand that with the collapse of the jute market the Agricultural Department in that Presidency is seriously considering the possibilities of an increase in the area under cane and the establishment of a white sugar industry. Experiments have been made with Coimbatore canes and Co. 213 has proved particularly successful. In the year 1929-30 approximately 200,000 acres were under cane and the outturn of *gur* is estimated at 220,000 tons. These figures suggest a low cane tonnage of about 11 tons (300 maunds) to the acre, but the Agricultural Department considers that much higher yields can easily be obtained. That Department is also of opinion that certain areas, notably Rajshahi district and portions of Rangpur and Bogra districts, afford opportunities for the establishment of the sugar industry. The time required for the crop to ripen varies considerably in different localities but it may be put at 8—12 months. As no factory exists, we have no figures regarding the working season but it should not be impossible to extend it to over 100 days. Holdings in Bengal are small and it may be difficult or impossible for a factory to obtain direct control over a sufficient area to supply its own needs. At the same time it should not be impossible for a factory to obtain its cane without undue difficulty in some localities. The cost of producing cane is estimated by the Agricultural Department at 7 annas a maund and it will be seen that this is well above the average figure we are prepared to adopt for the whole of India. We feel that the question has not yet been sufficiently investigated in Bengal and we have not sufficient information to enable us to form an opinion whether Bengal offers economic possibilities for the white sugar industry.

United Provinces.—The United Provinces are entirely subtropical and, as has been shown, cultivate more than 50 per cent. of the total area of cane grown in India. The latest estimate for 1930-31 is a figure of 1,430,000 acres. The crop is normally in the ground for from 9—11 months. Harvesting begins in December and continues till the end of March. A working season of 120 days is not uncommon. The estimated area for 1930-31 under improved varieties throughout the United Provinces is 514,000 acres, as compared with 281,000 in 1929-30 and 140,000 in 1928-29. So far as yield of cane is concerned, for indigenous canes with no special treatment 350 maunds or 13 tons is probably an average figure. On the other hand with Coimbatore canes carefully treated

with manures, etc., outturns of nearly 1,000 maunds or 36 tons have been achieved. The cost of growing cane is estimated at between 4 and 5 annas a maund. It is not usual for factories to have large areas of cane under their own direct control but in many localities the cane grower has by now become so habituated to delivering his cane to a factory for white sugar that the manufacture of *gur* in those areas has perceptibly declined. In certain parts of the Gorakhpur district we were told that at the end of one season the competition among the factories for cane was so keen that prices as high as 14 annas a maund were offered. At the same time there is room for new factories in other districts, especially in Rohilkhand, with further improvement in communications.

Bihar and Orissa.—The important cane growing tracts in Bihar and Orissa are entirely sub-tropical and in many respects resemble the United Provinces. Yields from indigenous cane are very poor in the present factory area in North Bihar, being not more than 200—300 maunds per acre. Coimbatore canes give on an average 400—500 maunds per acre. The crop, as in the United Provinces, remains on the ground from 9—11 months. Harvesting begins in December though with Co. 214 it can now be started in November and working seasons of over 120 days have been realised. In North Bihar much of the cane cultivation is in the hands of large planters and factories can consequently rely upon a regular supply of cane. At the same time it must be remembered that these plantations are mostly unirrigated and that the rainfall in this area is extremely erratic. The cost of producing cane works out at between 4 and 5 annas a maund. In South Bihar irrigation facilities are available and the Bihar and Orissa Government have informed us that with Coimbatore canes yields of 900—1,000 maunds per acre have been obtained. The Director of Agriculture informed us that in the Shahabad area large quantities of cane would be available. We can give no accurate figure for the cost of production in this area but we understand that it would not be uneconomic for the manufacture of white sugar.

Punjab.—Although the Punjab actually grows about half a million acres of sugarcane, the prospects so far as the .white sugar industry is concerned are limited to a small proportion of that acreage. The limiting factor is the necessity of obtaining as long a working season as possible and the season in the Punjab is itself limited by the danger of frost. So far, therefore, as the possibility of establishing factories is concerned, we need consider only the south of the Punjab where conditions are somewhat similar to those obtaining in the United Provinces. The average yield for the whole province from indigenous cane is put at 300 maunds per acre, while Coimbatore canes give an increased yield, at least so far as *gur* is concerned, of from 20 to 30 per cent. The crop is in the ground for 8 to 10 months. Harvesting begins early in December and continues into February. There is at present only one cane factory in the Punjab, at Sonepat, which is working this season for the first time. It is hoped to obtain a working season of at least

90 days. The cost of producing cane is estimated at about 5½ annas a maund. Improved canes are reported to be spreading rapidly and we see no reason why it should not be possible when the right cane is found and the arrangements with the cultivators are completed to produce white factory sugar in the south of the Punjab at economic rates.

The Coimbatore Research Station.

12. We feel we should make some reference in this Chapter to the work now being done under the energetic guidance of Rao Bahadur T. S. Venkataraman at the Coimbatore Research Station. There is no need in this report to recapitulate the history of the earlier work done at the station which has been fully described in Chapter XXIV of the Sugar Committee's Report (1920). Since that report appeared many canes have been issued to the provinces for thorough trial and some, notably Co. Nos. 205, 210, 213, 214, 219 and 290, have been undoubted successes. The work of the station is devoted entirely to breeding new canes. This is a task of special difficulty for various reasons. Some varieties do not flower at all, others are infertile and young seedlings are exceptionally delicate. Again, the plants from seeds do not necessarily resemble one another or either of the parent plants and the inheritance of characteristics in canes has not yet been traced to any well defined laws. The practice adopted must, therefore, be a system of trial and error and involves the growth of and selection from hundreds of thousands of canes. Parents are selected for their known characteristics and the technique of breeding has been considerably simplified and rendered more reliable in recent years. But the fact remains that seedlings from parent canes of desirable characteristics may show none of those characteristics. The seedlings from any given stock are therefore watched and only those which show possibilities of improvement are further propagated by the ordinary means of cuttings or setts. Comparisons are again made after more extensive trial between these selected canes and a final selection is made of those canes which appear to possess the necessary characteristics for particular parts of India. Sucrose content, fibre content, period of ripening, resistance to disease and frost, field yield and tillering propensities and suitability for milling in factories are but a few of the factors which have to be taken into consideration. Hitherto the attention of the station has been focussed, as is natural, chiefly upon producing improved cane which will be suitable for conditions in the main sugar belt, that is, Bihar and Orissa and the United Provinces. Mention has already been made of some of the canes which have been successful and we have been informed by the officers of the Agricultural Department that with the spread of these varieties a minimum of 50 per cent. increase in output may be expected. The United Provinces Government have stated that, whereas indigenous varieties may be expected to yield 350 maunds an acre, Coimbatore varieties cultivated under the same system will yield 600 maunds and cultivated intensively on the Java system will yield up to 1,000 maunds per acre. Similarly, the Bihar and Orissa Government report that where an outturn from Hemja—the indigenous cane—of 300 maunds

an acre may be expected, Coimbatore canes will yield 400 to 500 maunds. At the same time the sucrose content of the cane is superior. The United Provinces Government adopt a figure of 11·5 per cent. sucrose for Coimbatore canes and we believe that this is higher than the figure for indigenous cane. In the Punjab we were told that Coimbatore canes gave an increase in yield of 20 to 30 per cent. and that these canes are gaining steadily in popularity. We may also mention that at every white sugar factory we visited in these three provinces we were told that Coimbatore canes were a vast improvement and in many cases a premium of as much as one anna a maund was paid for special varieties, as for example for Co. 214 which ripens early and thus enables the factory to prolong its working season. The following figures supplied by a factory near the boundary between Bihar and the United Provinces are intersting:—

Cane.	Sucrose.	Fibre.
Roora	11·38	13·63
Pansahi	12·84	10·57
Bhowaria	14·06	17·48
Co. 213	13·60	15·70
Co. 210	12·25	16·83
Co. 205	12·53	20·70

Of these canes some of the indigenous varieties give a field yield as low as 150 maunds an acre while some of the Coimbatore varieties yield as much as 800 maunds an acre. These successes in different parts of India, where different climatic and seasonal and other problems have to be considered and solved, reflect great credit on the work of the staff at Coimbatore. We understand that attention is now being directed towards evolving new canes suitable for the tropical conditions of the more southerly provinces.

The *Gur* Industry.

13. *Gur* is the main product from sugarcane throughout India and it is estimated that between $2\frac{1}{2}$ and 3 million tons are consumed annually. The following table shows the averages of *gur* production for the principal cane growing provinces excluding Central Provinces, Burma and Indian States, from 1908:—

	Tons.
1908-09 to 1910-11	2,161,000
1911-12 to 1913-14	2,435,000
1914-15 to 1916-17	2,585,000
1917-18 to 1919-20	2,864,000
1920-21 to 1922-23	2,671,000
1923-24 to 1925-26	2,893,000
1926-27 to 1928-29	2,966,000

It is clear that any system of protection for the sugar industry in India must be very largely concerned with the production of *gur*.

The manufacture of *gur* is a simple matter and is carried on throughout India under varying local conditions. The cane is crushed in a small three roller mill usually turned by bullocks, though more or less satisfactory power mills have now been devised and their use is on the increase. The expressed juice is carried by hand in jars or tins to the boiling pan and boiled until it begins to solidify. As the boiling proceeds, the scum is removed and various clarifying agents are introduced. When the juice is beginning to solidify it is rapidly stirred until the required consistency is reached. It is then run off into wooden moulds or earthenware vessels. The resultant *gur* varies greatly in quality from province to province and may be used either for eating, for refining or for making sweetmeats and confectionery. The highest class eating *gur* is generally considered to be produced in the Bombay Deccan and in the Meerut neighbourhood in the United Provinces. But we have frequently been told that *gur* prized highly in one district may find practically no market in an adjoining district and it is clear that it is the subject of strong local prejudices. However universally popular *gur* may be as an article of consumption, it has never been denied that as a product from cane it is extremely wasteful so far as the sugar content of the cane is concerned. In the first place, the cane itself is subjected to one crushing only and the bagasse still contains a large quantity of juice. In the second place, the boiling is often carelessly done and inversion from sucrose to glucose takes place to a large extent. This inversion is not, strictly speaking, a loss of sugar, but it is a loss of crystallisable sugar which is of importance if the question of refining from *gur* is considered. The actual sucrose content of *gur* varies considerably but may be placed at between 65 and 75 per cent. as compared with between 99 and 100 per cent. for white sugar. It is true that some Bombay *gur* has a much higher sucrose content but it commands in normal times a correspondingly higher price and the difference is largely due to the richer canes used. The Indian Sugar Committee in their Report (paragraphs 291 *et sqq.*) laid considerable stress on the desirability of designing efficient power mills for *gur* manufacture. Since that report was written considerable progress has been made. We give below figures showing the extraction of *gur* per 100 maunds of cane as estimated in various provinces:—

	Bullock Mill. Maunds.	Power Mill. Maunds.
Madras	9	10
Bombay	9·92	10·88
Bengal, Punjab	About 10 maunds from both.	

The following table compares the cost of manufacture by the two methods as given by the Agricultural Departments in the

different provinces. It should be noted that the costs are not strictly comparable between the various provinces.

Cost of manufacture per md. of *gur*.

	Bullock Mill.		Power Mill.	
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Madras . . .	1 3 0 to	1 5 4		0 8 0
Bombay . . .		1 9 0		1 7 0
Bengal . . .		2 3 0		1 7 0
Punjab . . .	1 14 0 to	2 7 0	1 3 0 to	1 10 0
United Provinces .	2 6 11 to	2 13 10	1 3 1 to	1 5 1

It will be evident that on these figures the cost of production by a power mill is distinctly lower even if allowance is made for depreciation and other charges, and that, generally speaking, a better extraction may be expected. In effect the actual mills used, whether with bullocks or a power plant, need differ little but the bullock mill is limited by the capacity of the bullocks and the rollers are in practice often eased off on this account, thus causing greater loss in extraction. According to the Director of Agriculture, Bombay, the extraction of juice per 100 maunds of cane is 62 per cent. from a bullock mill and 68 per cent. from a power mill.

The White Sugar Industry. (*i*) Central factories.

14. Appendix I gives a complete list of all white sugar factories actually working in India at present. It will be seen that there are 29 factories capable of working direct from cane though, in a review of the season 1929-30, the Sugar Bureau, Pusa, reports that only 27 factories actually worked. The total output of white sugar for all central factories for the same season is reported as 89,000 tons of which 80,000 tons were manufactured in Bihar and Orissa and the United Provinces. The following are the production figures that have been supplied to us by the Sugar Bureau, excluding Burma:—

Year.	Tons.
1921-22	28,250
1922-23	23,620
1923-24	39,150
1924-25	33,720
1925-26	52,390
1926-27	59,540
1927-28	67,950
1928-29	68,600
1929-30	89,800

We think it worth while pointing out here that these figures are indicative of a real advance on the industrial side. The Indian Sugar Committee (1920) stated: "The defects of the sugar houses in India do not lie so much in the machinery as in the control which is exercised over it..... We have assumed that cane in India contains on an average 12 per cent. of sugar. If it were

dealt with in a thoroughly efficient factory it would be possible to obtain 9·5 per cent. of marketable sugar from it. From cane with the same sugar content factories in Java recover 9·75 per cent. of marketable sugar against an average of 6·85 per cent. in Indian factories, the best of which obtain less than 8 per cent." As will be seen later, we have assumed a sucrose content for the big sugar producing provinces of 11·5 per cent. and the following table of extraction percentages actually reached gives a clear idea of the progress that has been made since the Sugar Committee reported:—

	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.
Bihar and Orissa .	7·98	8·67	8·80	8·61	8·90
United Provinces .	7·88	7·93	8·07	8·37	9·00
Bombay, Madras and Burma . . .	8·98	10·26	10·09	9·93	10·12
Average for India .	8·07	8·49	8·62	8·59	9·07

Admittedly the sucrose content in Bombay and Madras is higher and the recovery percentage consequently stands at a higher figure. The figure of 8·90 and 9·00 for Bihar and Orissa and the United Provinces and the increase in the all India figure from 6·85 to 9·07 in ten years show that the factories have been fully alive to the possibilities of improvement and have not been content with inefficient working. We may add here that we made a point of examining the conditions of labour at the various factories we visited. During the working season a factory will employ on the average 1,000 hands though in some cases the number is much higher. The employees are almost entirely drawn from the agricultural classes and, as we shall show later, this employment comes at a time when their agricultural labour is the lightest. Consequently most of the employees prefer to live in their villages and attend at the factories as daily paid labourers. At the same time we found in the factories which we examined that they do provide adequate accommodation throughout the year free of charge for any who wish to stay and also supply free water and medical attendance, and we satisfied ourselves that the industry had not neglected this side of its duties.

(ii) Refineries.

In 1923-24 the outturn of white sugar from refineries amounted to 56,555 tons and this outturn was till recently well sustained, the figure for 1927-28 being 49,364 tons. In 1928-29 there was a sharp fall to 31,047 tons and for 1929-30 though the final figures are not yet available we understand that from the 14 refineries now existing in India a further greatly diminished output is anticipated.

(iii) The *Bel* industry.

In a later chapter we give our reasons for thinking that the opinion of the Sugar Committee regarding the indigenous process of white sugar manufacture can no longer be sustained. The process consists of boiling the juice obtained from the cane in bullock or small power

mills in a series of open pans. The rab or massecuite is then worked in small centrifugals and the white sugar separated out. Actual figures and reliable data regarding the industry are extremely difficult to obtain but the United Provinces Government have provided us with evidence to the effect that in this branch also considerable progress has been made. The recovery percentage has risen from 4 per cent. as estimated by the Sugar Committee to 5·25 per cent. The outturn of sugar by this method has probably not increased as our estimate would put it at about 200,000 tons against the Sugar Committee's estimate of 250,000 tons. We do not lay claim to any real degree of accuracy for this figure nor, we imagine, is the Sugar Committee's estimate free from doubt. The system of manufacture is of importance in the transitional stage of the industry since it can be undertaken in tracts where either owing to want of communications or the scattered nature of the cane areas, the manufacture in central factories is at present impossible.

Imports of white sugar.

15. We give below the figures showing the course of imports of white sugar into India. The following table gives the triennial averages of imports and at the same time the level of revenue duty in force:—

Years.	Imports in tons.	Duty.
1908-09—1910-11 . .	562,000	5 per cent. *ad valorem*.
1911-12—1913-14 . .	625,000	5 ,, ,, ,, ,,
1914-15—1916-17 . .	436,000	5 per cent. *ad valorem* to 28-2-16. 10 per cent. *ad valorem*.
1917-18—1919-20 . .	411,000	10 ,, ,, ,, ,,
1920-21—1922-23 . .	409,000	10 per cent. *ad valorem* to 28-2-21. 15 per cent. *ad valorem* to 28-2-22. 25 per cent. *ad valorem*.
1923-24—1925-26 . .	582,000	25 per cent. *ad valorem* to May 1925. Rs. 4-8-0 per cwt.
1926-27—1928-29 . .	793,000	Rs. 4-8-0 per cwt.
1929-30	1,000,000 (approx.)	Rs. 4-8-0 per cwt. to 28-2-30. Rs. 6-0-0 per cwt. from 1-3-30.

It will be seen that the imports in 1913-14 were in the neighbourhood of 630,000 tons. There was a pronounced fall during the war years and the increase since the war was for some years only a return to the pre-war position. The subsequent increases appear to us to be due to the increase in consumption which has resulted from the increase in the habit of tea drinking and of the use of other sweetened beverages. A comparison with the acreage figures of cane cultivation set out earlier in this chapter will show that no relation is indicated between the acreage figures and the amount of white sugar imported.

16. We turn now to a brief consideration of the course of sugar prices. The following figures of prices have been supplied to us by the Imperial Council of Agricultural Research:—

Course of prices in India.

Market prices of Java white sugar per maund at Calcutta.

Year.	Highest.	Lowest.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
1920-21	40 0 0	17 12 0	29 14 0
1921-22	26 8 0	12 8 0	16 8 4
1922-23	19 0 0	14 3 0	15 9 9
1923-24	20 2 0	15 3 0	18 0 8
1924-25	17 12 0	12 0 6	14 1 7
1925-26	12 4 0	9 6 6	10 13 9
1926-27	13 2 0	10 10 0	11 13 11
1927-28	11 6 3	9 11 0	10 6 0
1928-29	11 1 3	9 0 0	9 12 6
1929-30	9 7 0	8 3 6	9 0 2
1930-31 (to date)	9 1 6	7 15 0	...

In July 1920, the price of sugar touched its maximum. Although the duty was at that time only 10 per cent. *ad valorem* the Calcutta price reached the high level of Rs. 40 per maund. Since then prices have steadily declined till in November and December the market price in Calcutta touched the figure of Rs. 8-1 per maund and the lowest price touched has been Rs. 7-15 a maund. There has been a slight improvement since and sugar at the time of writing stands at about Rs. 8-3 or Rs. 8-4. The following table shows the course of the revenue duty on white sugar:—

To February 1916	5 per cent. *ad valorem*.
March 1916—February 1921 . .	10 ,, ,, ,, ,,
March 1921—February 1922 . .	15 ,, ,, ,, ,,
March 1922—May 1925 . . .	25 ,, ,, ,, ,,
June 1925—February 1930 . . .	Rs. 4-8-0 per cwt.
March 1930	Rs. 6-0-0 ,, ,,

It is interesting to observe that the increase in the revenue duty has been followed by a decline and not an increase in price. In particular the increase of duty of Rs. 1-8 per cwt. in March 1930 does not appear to be fully reflected in the price. We find in February 1930 the price stood in Calcutta at Rs. 8-3-6 per maund, in March it rose to Rs. 8-14-6 and in April to Rs. 9-1-6, increases of 11 annas and 14 annas a maund respectively against an increase in the duty of Rs. 1-1 per maund. Thereafter prices declined reaching Rs. 8-12-6 in July and Rs. 8-14 in August. Subsequently prices fell still lower as has been shown above.

17. We have given earlier in paragraph 10 of this Chapter the acreage figures for all India and have referred to the large rise consequent upon the boom in 1920-21 and we have also shown that the rise in acreage in 1926-27 and 1927-28 was due to high prices obtained for *gur*. Actually the total acreage in India has remained remarkably constant during the last 20 years and we think that the variations show chiefly interaction of price and production. Sugarcane is an expensive crop to grow, demanding considerable cash outlay, especially in certain provinces. There is consequently a noticeable lag between years of high prices and years of big acreage, which is all the more pronounced by reason of the fact that in some parts cane is an 18 months crop. That the price of *gur* has a very direct effect upon the acreage under cane we do not for a moment doubt, though other factors such as failure of water supply, high price for competing crops, the price obtained for other crops in *gur* purchasing areas and difficulty in obtaining advances of money for planting must not be ignored. But we find great difficulty in arriving at any all India figure for the price of *gur* which is comparable with the area figures for all India. As we have already pointed out the taste for *gur* may vary from district to district and when *gur* is at a high price in one locality it may be cheap in a locality two hundred miles away. Since the publication of rail borne trade statistics has been discontinued we have been unable to follow the movements of *gur* from one part of the country to another, but that it does move considerable distances has been definitely stated to us by many witnesses. *Gur* is imported into Bombay for instance from Madras and from the United Provinces. Thus though prices may vary from one district to another any big variation either in price or production is likely to be felt throughout a large part of the country. Apart from stating this general conclusion which is supported by all the evidence we have received we can only quote local figures and, as we have pointed out, so many other considerations may affect the area under cane in any particular locality that an attempt to demonstrate with precision the relation between the price of *gur* and the acreage under cane on a consideration of local figures would in our opinion be fruitless.

Relation between *gur* prices and area under cane.

18. The following extract from a statement by the Imperial Council of Agricultural Research will give some indication of the decline which has occurred in recent years in the price of *gur*. "Sugar prices fell sharply in 1924-25 and imports increased; *gur* prices also fell for the Director of Agriculture, United Provinces, reported the average price for the season 1927-28 in Meerut District (one of the most important areas for good quality eating *gur*) to be as low as Rs. 4 per maund, actual prices in February and March being Rs. 3-6 and Rs. 3-10 per maund respectively. As the Indian Sugar Committee stated the price of Meerut *gur* to be Rs. 5-1 per maund in 1913, it is clear that in 1927-28 *gur* prices

Relation between sugar and *gur* prices.

in this important sugarcane tract were even below prewar standards. In 1928-29 and 1929-30 the area under cane in India fell sharply to 2,727,000 acres and 2,504,000 acres, the corresponding estimates of *gur* production being 2,895,000 tons and 2,766,000 tons respectively. It will be noted that, though *gur* prices recovered somewhat in 1928-29 and *gur* production in that year only amounted to 2,895,000 tons, a fall of nearly 500,000 tons, there was no recovery in the cane area of 1929-30. It is clear that when the prices of imported sugar fall below about Rs. 12 per maund (duty paid) at the ports, *gur* prices fall to a comparatively unprofitable level and cane cultivation contracts. It is also clear that *gur* however plentiful does not replace sugar to any material extent and that only by the manufacture of white sugar in India by modern methods can imports of foreign sugar be reduced". The effect of changes in the price of sugar on that of *gur* is a subject which we discuss more fully in another chapter. Meanwhile it may be pointed out that according to the figures supplied us by the United Provinces Government the area under cane in the Meerut Division in 1924-25 was 306,514 acres, while in 1926-27 it reached the figure of 409,731. An increase in area of over 100,000 acres taken in conjunction with the increased yield obtained from new varieties, is sufficient to account, very largely at least, for the low prices for *gur* reported in 1927-28, especially as the acreage for the year 1927-28 remained at practically the same figure. In the Punjab in the same period the acreage figures as given by the Punjab Government are:—

	Acres.
1924-25	395,632
1925-26	389,627
1926-27	447,960
1927-28	498,624

The large increase in the outturn of *gur* in the Punjab may also have had a depressing effect upon the United Provinces prices by restricting the export market. At the same time there are two directions in which the price of imported sugar may to some extent affect the price of *gur* particularly in the neighbourhood of the ports. We were specifically told by cane growers from the Deccan Canals area and also by witnesses in other parts of the country that the small imports of Java *gur* or cup sugar which have taken place, though negligible in quantity, have had a real depressing effect on the *gur* market by reason of the apprehensions raised of still larger imports. It is likely that where the cultivator and *gur* manufacturer are not of a high level of intelligence and education, the situation may well be taken advantage of by the middleman to obtain his *gur* at a lower price. A second source of danger to the *gur* industry is the manufacture at the ports of banawat or imitation *gur*. This trade has been carried on spasmodically for a number of years and proves profitable when *gur* prices are high and sugar prices are low. Sugar not below 20 Dutch Standard

is selected according to the colour to be attained and is mixed in perhaps equal proportions with Indian *gur*. The cost of manufacture is practically negligible and the product is cheaper than pure *gur*. We have been told that in some cases molasses is used for this adulterated *gur*. One prominent sugar merchant in Bombay who has himself at times dealt in banawat *gur* expressed the view that it constituted a serious menace to the *gur* industry and suggested that legislation should be introduced to prohibit its manufacture.

CHAPTER III.

Conditions of the Fiscal Commission.

19. In considering whether the Sugar industry satisfies the three conditions for the grant of protection laid down in paragraph 97 of the Fiscal Commission's report, it must be remembered that the industry differs materially from the class of industrial undertaking which the Fiscal Commission contemplated as normally forming the subject of investigation by the Tariff Board. Our terms of reference make it clear that the term Sugar Industry must be understood to include the growing of sugarcane in India, the manufacture of *gur* including *rab* and jaggery and the manufacture of crystalline sugar. In the case of sugar products, whether *gur* or crystalline sugar, the cost of sugarcane forms by far the greater part of the total cost of production. Speaking generally, of the total cost of producing white sugar direct from cane about two-thirds may be taken to represent the price of cane delivered at factory, while in the case of *gur* manufacture the proportion is even higher. In recent years the efficiency of sugar factories in India has rapidly increased and an over all recovery of about 80 per cent. of the sugar in cane has already been reached by one group of factories. This figure represents a standard of efficiency barely 5 per cent. less than the average in Java and considering that cost above material forms the smaller part of the total costs of sugar manufacture, it is obvious that the scope for any substantial reduction of cost in this direction is limited. When it is remembered that in the steel industry iron ore costs less than a tenth of the value of the finished product, it will be realised how vast is the difference between sugar and other industries as regards the factors on which further progress depends. The future of the Sugar Industry depends mainly on the cost of producing the primary material, *viz.*, cane, and the problem is, therefore, one of protecting a particular branch of agriculture until such time as improvements in methods of cultivation and developments in research enable the agriculturist to increase his yields per acre and thereby effect a substantial decrease in the cost of cane, while maintaining or increasing his own profits. We have thought it necessary at the outset to emphasize this aspect of the problem, because in our view the interest of the agriculturist is threatened not only by the import of foreign sugar but also by the market reactions which may result from the largely increased output which may be expected in the near future from the introduction of improved varieties of cane on a large scale. While it would be most unfortunate from the national point of view that the white sugar factories, which occupy so important a position in agricultural economics, should succumb to foreign competition, it would

Cane cultivation of the highest national importance.

be little short of disastrous if, whether as in Rohilkhand as a direct result of the competition of foreign sugar or elsewhere partly for the same reason and partly on account of the failure to provide an outlet for the increased production of improved canes, the receipts of agriculturists from this source fell substantially and the area under cane diminished. It is obvious that the question of the protection of agriculture must depend on considerations of national advantage far wider than the purely economic aspects of protection dealt with in paragraph 97 of the Fiscal Commission's report. The matter is one which we propose to deal with at length at a later stage of the report. Meanwhile no useful purpose would be served by considering whether cane growing as such satisfies the conditions laid down in paragraph 97 of the Fiscal Commission's report since, apart from considerations of national advantage, the question of cane growing depends for its importance on the products manufactured from cane. In this chapter we propose, therefore, to consider the industrial side of the subject in relation to the conditions laid down in the Fiscal Commission's report, reserving for later consideration the wider aspect of the national importance of the industry which concerns more particularly the future of sugarcane cultivation.

No case for protection of refining industry.

20. It will be convenient to consider in the first place the question of the manufacture of sugar from *gur* or jaggery. There are at present 14 refineries: in addition a number of factories normally manufacturing direct from cane are also equipped to manufacture from *gur*. Most of these refineries work intermittently and it is seldom possible, save in exceptional periods of high sugar prices, to manufacture continuously over a number of years. The reason for the failure of refineries to attain any measure of industrial success is to be found in the relation of *gur* and sugar prices. As we have seen in the previous chapter, though the price of imported sugar may have some effect on the price of *gur*, the relation is obscure. Where the prices of both commodities rise or fall, the variation is not proportionate in each case while not infrequently the prices of the two commodities move in opposite directions. In these circumstances the business of refining becomes extremely speculative, since the manufacturer may be unable to obtain his raw material save at prices which render loss on the sale of the sugar produced unavoidable. Nor in existing conditions in India is the refining of *gur* an economic form of sugar production. Refining direct from cane an average outturn of 9 per cent. or over of sugar on cane is obtained by several factories in India. On the other hand, 100 maunds of cane in Northern India may be expected to give about 10 maunds of *gur*. The sucrose content of *gur* varies between 60 and 75 per cent. and on the whole not more than 55 per cent. sugar from *gur* can be expected. The return from 100 maunds of cane manufactured into *gur* and then refined is not more than 5½ maunds sugar against 9 maunds obtained by direct manufacture from cane while the amount of molasses pro-

duced is approximately the same per unit of cane in each case. The process therefore is wasteful and is not designed to make the best use of the country's resources, while from the manufacturer's point of view the results for the reasons already given are necessarily speculative. It follows that normally the refining industry would prove uneconomical but in times of depression when the price of Indian *gur* is low it may be possible to refine it into white sugar at a profit. In such cases the measure of protection which we propose for the Sugar Industry will afford assistance to the refining industry also. It might be possible on the other hand to establish the refining industry on the basis of the import of unrefined sugar from abroad. But this result could be brought about only by the lowering of the revenue duty now imposed on low grade imported sugar. This however would facilitate the import of Java *gur* or low grade sugar from which the manufacture of imitation *gur* could be undertaken. In other words, the interests of the refiner and of the *gur* manufacturer, who is usually also the cane grower, are opposed and it is necessary to choose between the two in extending assistance by way of tariffs. It appears to us that the refining industry fails to satisfy the conditions laid down in the Fiscal Commission's report. If Indian *gur* is used, the process is uneconomic and there is little prospect that the third condition of the Fiscal Commission will be satisfied. If foreign low grade sugar is used, the first condition of the Fiscal Commission is not fulfilled. We believe, therefore, that no case exists for extending protection to the refining industry as such and any possible increase in the costs of refining as the result of any measure of protection extended to other branches of the Sugar Industry should not be considered an obstacle to such proposals. On the other hand, it may be pointed out that so long as refineries utilise Indian *gur* as their raw material they provide *an outlet for cane which*, as we shall see later, is most desirable. While considering that the refining industry does not as such qualify for protection, it must not be forgotten that during the period when *gur* prices are falling its continuance will be of material assistance to the industry as a whole.

Fiscal Commission's first condition considered.

21. We turn now to a consideration of the conditions of the Fiscal Commission in relation to other branches of the industry. The first condition lays down that the industry must be one possessing natural advantages such as an abundant supply of raw material, cheap power, a sufficient supply of labour or a large home market. The question of cheap power is not material in this enquiry since for the manufacture of sugar practically the whole of the fuel required for generating power is provided by the bagasse. As regards the home market, India at present imports approximately one million tons of sugar annually, about 100,000 tons is manufactured in India in refineries or central factories, while a varying amount estimated at 200,000 to 250,000 tons is manufactured by khandsaris mainly in Rohilkhand by the *bel*

method. In addition to this some 2½ million tons of *gur* are consumed each year. The total consumption of *gur* and sugar in the country may be valued at not far short of Rs. 60 crores annually. Java, Cuba, the West Indies, Mauritius and Hawaii, the most important of the cane sugar producing countries, have practically no home market, the total consumption in these areas amounting to about 630,000 tons against a production of about 8,800,000 tons annually. It is obvious, therefore, that in this respect India enjoys a decided advantage.

Cheap labour easily available.

22. In regard to labour also India stands in a favourable position. Since the sucrose content of cane rapidly decreases if any considerable interval elapses between cutting and crushing in the mill, it is essential that sugar factories should be situated within easy reach of their cane supplies. Thus the majority of factories are established in rural areas and draw their labour supplies from the surrounding villages. Since the season for sugar manufacture extends roughly from the time when the *kharif* crop is reaped until the *rabi* harvest, the months in which agricultural employment is normally small, little difficulty is experienced in securing an adequate supply of labour. Wages also compare favourably with those paid in other countries. The following are the rates of labour given by Maxwell in his "Economic Aspects of Cane Sugar Production"—

Countries	Wages per diem.
	s. d.
Java	0 10
Philippines	1 6
Natal	2 8
Mauritius	3 6
Cuba	5 0
Hawaii	6 0
Queensland	17 0

The average wages paid at factories in India is about 8 annas or 9*d*. a day. It will be seen, therefore, that with the exception of Java the rates of wages are at a distinctly higher level than the prevailing rates in India.

Supplies of cane.

23. The total area under cane in India has varied between about three million acres and rather over two million acres in the last 20 years. Yields of cane per acre vary; excluding from consideration improved varieties of cane, outturns of 30 tons per acre or more are common in the tropical conditions of Madras and in Bombay where intensive cultivation is practised, while as low a figure as 10 tons per acre is recorded in the Punjab where the growth is retarded by the low temperature and short monsoon. So far as

the manufacture of *gur* is concerned, it is evident that the condition requiring an abundant supply of raw material is fully satisfied. *Gur* manufacture is as a rule carried out by the cultivator in close proximity to his cane cultivation and the whole output of cane in India, less the amount used for chewing, can be considered as potential raw material for *gur* making. As regards the manufacture of white sugar from *rab* in Rohilkhand the position is similar. *Rab* is manufactured within easy reach of the cane supplies and sugar extracted locally in centrifugals. It is not so clear on a mere consideration of the area under cane that an adequate supply of raw material exists for central factories. For the manufacture of sugar direct from cane it is essential that there should be not merely a sufficient quantity of sugarcane in existence but that the cane should be fresh as it arrives at the factory, since the sugar content of cane deteriorates rapidly after the stalks have been cut. In Indian conditions where transport is generally by cart, a radius of 16 miles from the factory is considered as constituting the limit within which cane supplies should be obtained. Where transport is by rail, supplies can be drawn from a greater distance, but even in this case the fact that it is usually considered desirable to deliver cane at the factory within 24 hours of cutting imposes a limit on supplies. It follows, therefore, that for the successful working of a sugar factory supplies of cane should be concentrated in the vicinity of the factory. We give below the percentage of cane to total areas under cultivation in the most important cane growing provinces in India in the year—

	Total area under cultivation.	Area under cane.	Percentage.
	1928-29.	1928-29.	
Madras .	38,779,144	89,075	0·23
Bombay (including Sind) .	33,441,334	64,748	0·19
Bengal . .	28,702,700	195,800	0·68
Bihar and Orissa	30,057,000	287,400	0·95
United Provinces	43,107,736	1,344,559	3·12
Punjab . .	31,961,745	400,904	1·25

In Indian conditions a factory crushing 13 lakhs of maunds or 48,000 tons of cane in a season of 120 days may be considered an economic unit. Supply would normally be obtained within a radius of 16 miles or from an area of 514,720 acres. For the purpose of our calculation we may assume in Northern India the minimum yield of 10 tons an acre, in Bengal 15 tons an acre and in Madras and Bombay where intensive cultivation is practised 20

tons an acre. The position of a factory in the different provinces is shown below:—

	Outturn tons cane per acre.	Acres required to supply factory.	Area from which supplies can be drawn.	Percentage of 2 on 3.
	1	2	3	4
Madras . . } Bombay . . }	20	2400	514,720	·46
Bengal . .	15	3200	514,720	·62
Bihar and Orissa . . } United Provinces . . } Punjab . . }	10	4800	514,720	·94

Comparing this table with that on the previous page, it will be seen that there is good reason to suppose that the cane areas are sufficiently concentrated to admit of white sugar manufacture on an economic scale in the Punjab, the United Provinces, Bihar and Orissa where most of the cane is grown in the four northern districts, possibly in parts of Bengal, but not in Bombay and Madras save possibly in favoured localities. We must not be taken as implying that it would be possible to establish with success a factory in any locality in these areas. Other difficulties may occur. For example, in the northern portions of the Punjab the period during which the cane ripens and can be retained in the ground may for climatic reasons be too short to permit of the economic working of a factory. It has, however, been found possible both in the United Provinces and Bihar to extend the working season to about 120 days, a period which permits of economic working. Again, in some localities where *gur* of special excellence commands a high price, difficulties may be experienced in securing adequate supplies of cane. There are also certain fundamental disadvantages under which India labours as regards the cultivation and supply of sugarcane. These arise chiefly from the fact that the main sugarcane belt in India lies almost entirely outside the tropics and therefore climatic conditions such as rainfall and temperature affect the growth and yield of sugarcane adversely as compared with tropical countries. Another disadvantage is the prevailing system of land tenure which leads to the cultivation of sugar-cane in small and scattered holdings, rendering improved tilling and the organized supply of cane to central factories matters of considerable difficulty. In spite of these disadvantages, we are satisfied that with continued progress in the introduction of superior varieties of cane and further improvement in processes of manufacture, the existing areas under cane will ultimately suffice to yield at a reasonable cost a large proportion of the amount of sugar at present imported while maintaining or extending the supply of *gur*.

24. The second condition contained in paragraph 97 of the Fiscal Commission's report lays down that the industry must be one which without the help of protection either is not likely to develop at all or is not likely to develop so rapidly as is desirable in the interests of the country. The Sugar Industry is at present protected by a high revenue duty the incidence of which is as follows:—

Fiscal Commission's second conditions satisfied. (*i*) *Gur.*

Sugar crystallised or soft 23 Dutch Standard and above . . .	Rs. 6 per cwt.
Sugar crystallised or soft inferior to 23 Dutch Standard but not inferior to 8 Dutch Standard . . .	Rs. 5-8 per cwt.
Sugar below 8 Dutch Standard and sugar candy	25 per cent. *ad valorem* plus Rs. 1-8 per cwt.
Molasses	25 per cent. *ad valorem*.

Under our terms of reference it is necessary to consider whether this duty should be converted into a protective duty and, if so, whether it should be increased or diminished. So long as the duty remains a purely fiscal measure, its continuance from year to year is a matter which must depend entirely on the revenue requirements of Government and no certainty exists that the protection at present afforded by it will not be reduced or removed on considerations other than those affecting the stability of the industry itself. Obviously in such circumstances in considering whether the second condition of the Fiscal Commission is fulfilled, it is necessary to start with the assumption that no duty is imposed on imported sugar other than the general rate of import duty for the time being in force. We are informed by the Collector of Customs, Madras, that in 1929-30 small consignments of Java *gur* classified as below 8 Dutch Standard were landed and sold at Rs. 32 per 500 lbs. This corresponds to a price of about Rs. 5 per maund. The average price of *gur* in Madras in 1929 has been given to us by the Madras Government at about Rs. 8·25 per maund and even assuming that this price represents in whole or in part the price of superior eating *gur*, while Java *gur* is of inferior quality, it will appear that with the rate of duty in force in 1929-30 (25 per cent. *ad valorem*), imported *gur* constituted a serious potential danger to the indigenous industry, at any rate in the seaport towns. We have ascertained from refineries using palmyra jaggery that the average rate for that class of jaggery, which fetches a price considerably below that of cane jaggery or inferior *gur*, varied in 1929 between Rs. 22-8 and Rs. 28 per candy of 500 lbs., or on an average about Rs. 4 per maund. This is approximately the price at which Java *gur* could be landed *ex* duty. It is obvious, therefore, that if no revenue duty existed on imported sugar, the danger to the indigenous *gur* industry would be overwhelming. Madras is not the only port where small imports of Java *gur* have been made. We have heard of similar shipments

to Bombay. 19,000 bags were imported into Karachi while a refinery in Lucknow has also imported appreciable quantities. In existing conditions the danger from the import of Java *gur* is not considerable since we understand that no more than 20,000 tons is made annually by small farmers in Java. The large factories have not turned their attention to its manufacture. It is however not impossible that in the future Java manufacturers may undertake its manufacture on a commercial scale and developments in research, particularly in the direction of devising means to preserve *gur* from deterioration, may yet constitute the import of Java *gur* a menace to the Indian *gur* industry. But apart from the import of *gur* as such the manufacture of imitation *gur* is even with the present duty at times a profitable business, and is being carried on intermittently in Calcutta, Bombay and Ahmedabad. For this purpose imported sugar and molasses is used in the proportion of 3:1. Imported sugar is also used to adulterate *gur*, provided the relative prices render it a profitable transaction. The present price of Java white sugar is Rs. 8-5-6 or Rs. 3-15-1 per maund *ex* duty landed at port. The price of molasses is Rs. 2-14 per maund f.o.r. Calcutta or about Rs. 2-5 per maund *ex* duty. The cost of molasses and imported sugar per maund of *gur* manufactured would thus amount to Rs. 3-8-7 per maund and, since the cost of manufacture is negligible, it should be possible to place such *gur* on the market with a profit at about Rs. 4 per maund. If the ordinary revenue duty of 15 per cent. was taken into account in the price of imported sugar and molasses, the price would be only Rs. 4-10 per maund. If brown sugar were used the price would stand at 4 annas less. Present retail prices of *gur* in the ports are—

Madras	Rs. 8-11-0 (September 1930).
Bombay	Rs. 11-6-10.
Calcutta	Rs. 7-15-0 (October 1930).

The actual cost to the cultivator of the cane required for manufacture may be stated as follows:—

	Cost per maund approximately.	Extraction per cent. cane.	Cane cost per maund *gur*.
	Annas.		Rs. A.
Bombay	12	12	6 4
Madras	12	12	6 4
Bengal	7 to 8	10	4 6 to 5-0

No allowance is made here for the cost of manufacturing *gur*, which may be taken at some Rs. 2 per maund if the labour of the cultivator and his bullocks is included in the cost, nor is any allowance made for the cost of transport to port.

These figures indicate that if no duty were imposed on sugar other than the normal revenue duty of 15 per cent. *ad valorem* indigenous *gur* would rapidly be replaced in the areas in proximity to the ports. Indeed it is probable that even with the existing

duty of Rs. 6 per cwt. on imported sugar, imported and imitation *gur* would replace Indian *gur* to a very large extent in the port towns if the flavour of Indian *gur* could be closely reproduced. There are many qualities of Indian *gur* distinguished by their flavour and each held in esteem and commanding a premium in certain localities. It is this feature of the trade which has enabled Indian *gur* assisted by the revenue duty to maintain its position generally up to the present time. But if the duty were withdrawn a crisis in the *gur* trade would ensue. Not only would the market be flooded with imitation and adulterated *gur*, but with sugar at little more than half the price of *gur* it is doubtful whether even the more conservative classes would long resist the pressure of economic forces.

(*ii*) Indigenous white sugar.

The effect of such conditions on the manufacture of white sugar by indigenous processes must also be considered. Throughout the whole of Rohilkhand with an area under sugar of over 300,000 acres, the manufacture of *rab* by the 'Bel' system and its subsequent conversion in centrifugals into white sugar is very largely practised.

We have been informed by the United Provinces Government that to obtain for the cultivator in Rohilkhand a satisfactory return for his cane, the price for sugar at Cawnpore must stand at between Rs. 11 and Rs 12 per maund and that if the price fell to Rs. 9 the manufacture of khandsari sugar would entirely cease. We have seen that at present Java sugar can be sold in Calcutta at Rs. 3-15-1 without duty. The rail freight to Cawnpore including terminals, interest, wastage, etc., amounts to about Rs. 1-9. This represents a price at Cawnpore of Rs. 5-8-1 per maund or allowing for a revenue duty of 15 per cent. Rs. 6-1-7. It is certain that under present conditions this price would not permit of the payment to the agriculturist of a price for his cane sufficient to cover his cost of cultivation even if no allowance is made for the possibility of unfavourable seasons. With the present low price of agricultural products, great distress would be caused and cane cultivation would practically cease with grave results to agriculture in general throughout this tract.

(*iii*) Factory sugar.

There remain the white sugar factories which at present produce between 80 and 90 thousand tons of sugar annually. Since at present many of these pay Rs. 5 or even more for cane per maund of sugar, it necessarily follows that with sugar at Rs. 5-8-1 per maund or allowing for a revenue duty of 15 per cent. Rs. 6-1-7 at Cawnpore these would either cease working or would be compelled to make such a drastic cut in the price of cane as would result in serious agricultural distress. In every direction then the absence of protection would mean disaster for the Indian sugar industry and the abolition or reduction of the present revenue duty, which indirectly affords substantial protection, would be followed by an agricultural crisis of far reaching dimensions.

25. The third condition laid down in the Fiscal Commission's report presupposes that conditions of free trade prevail at any rate to a very large extent throughout the world. It is clear that this is a necessary presupposition; for if a foreign Government decided to subsidize an industry directly or indirectly to an unlimited extent, no Indian industry in the same line of business could hope to face competition without protection, however efficient it might be. It has already been seen that beet cultivation is subsidized on a large scale while preferential tariffs are in force in several countries in regard to cane sugar imported from their colonies or dependencies. We give below a table of costs from the Report of the West Indian Sugar Commission:—

Fiscal commission's third condition considered.

(*i*) White Sugar.

	Production	Cost of Production. per cwt. *s.* *d.*	Year,
Cuba . . .	4,550,000	8 4½	1929
Java . . .	3,000,000	9 3	1926-27
Fiji . . .	90,000	12 3	1923-28
British West Indies .	250,000	12 4½	1928
Hawaii . . .	787,000	13 6½	1928
South Africa . .	270,000	15 8½	1926
Germany . . .	1,961,000	15 11½	1924-25
Formosa . . .	830,000	17 7	1928
U. S. Beet . .	1,010,000	18 8	1929
Australia . . .	517,000	23 0	1928
Argentine . . .	375,000	24 3	1927

Some of the figures given are out of date, in particular the figures regarding Java which require revision. As will be seen later an average Indian factory (allowing for the credit for molasses) can produce sugar at a cost excluding profit of about Rs. 11-3 or under 17*s.* 0*d.* per cwt., while we have come across one instance in which as low a figure as Rs. 10·5 or 15*s.* 9*d.* per cwt. has been reached by an Indian factory in specially favourable conditions. At the end of the protective period it is estimated that this figure will be reduced to Rs. 9-2 or about 13*s.* 8*d.* per cwt. It will be seen that the Indian cost at present is below that of Australia, the Argentine and Formosa and although it is probable that if free trade existed these countries would cease to produce, the position of the Indian industry would be different if it were adequately protected for a reasonable period. We estimate that the cost would then be reduced to about 13*s.* 8*d.* a cwt. with the prospect of considerable further reductions in the future as more suitable types of cane were evolved. This cost is considerably below the cost at which beet sugar can be produced. The total production of beet sugar may be placed at between 9 and 10 million out of a total world production (excluding British India) of about 24 million

tons, as estimated by Prinsen Geerligs. It is impossible that such a large quantity as this could be replaced by cane sugar save at a very greatly enhanced cost. Further the cost which we estimate for Indian factories at the end of the period of protection does not exceed that at which cane sugar is produced in most countries. It is about equal to the cost of Hawaii and is less than the cost in any other country except Cuba, Java, Fiji and the West Indies. We consider that ultimately the cost of manufacturing white sugar in India should not exceed that in any other country except Cuba *and Java. In view of the advantages, historical* as well as *climatic, which these countries possess for the* manufacture of sugar we do not anticipate that, as a matter of normal development, Indian costs will ever attain so low a level as in Java or Cuba. We do not however regard this as a circumstance which invalidates the claim to protection. From the point of view of the third condition laid down by the Fiscal Commission, the case for protection rests on two grounds which in our opinion are conclusive—first, that it is reasonable to expect that ultimately India can manufacture sugar at a cost not higher than that at which two thirds of the world's supply is now produced and secondly, that, if State assistance by means of subsidies and tariffs were withdrawn from those countries where the manufacture of sugar is entirely dependent on such assistance, the consequent reduction in the total supply of sugar available would raise world prices in spite of the low costs in Java and Cuba to a level at which it would be possible for India in course of time to compete unaided.

(*ii*) *Gur.*

As regards *gur*, we consider that the circumstances of the industry are such that the third condition of the Fiscal Commission is not strictly applicable. The need for safeguarding the *gur* industry from external competition arises mainly from considerations of national importance which are intimately associated with the preservation and development of sugarcane cultivation. This is a question which we reserve for further discussion at a subsequent stage. Hitherto Java *gur* has been imported in quantities so inconsiderable that the danger of competition can hardly be said to have assumed definite proportions. We understand that *gur* is produced in Java not by the large sugar manufacturers but by small farmers and that the output is not more than 20,000 tons annually. The small consignments which have arrived at Indian ports from time to time have been imported apparently with a view to testing the possibilities of the market rather than immediately displacing Indian *gur* on any considerable scale. Should Java sugar manufacturers seriously take up the question of the manufacture of *gur* with a view to capturing the Indian market, the risk involved if no duty were imposed would be so serious as to menace the whole future of Indian sugarcane and the industries dependent on it. It is in the national interest therefore that timely action should be taken to prevent the development of any organised attempt from outside to invade the Indian *gur* market. For the present, however, the market is held entirely by Indian made *gur* and such

shipments of imported *gur* as have appeared so far have been quoted on the market at rates which are more or less experimental. In these circumstances it would serve no useful purpose to consider whether the Indian *gur* industry would be able to dispense with protection. The data required for an accurate examination of the question are almost totally lacking. Judged by present experience, imported *gur* may be said to consist of the cheaper grades of inferior sugar, Java cup sugar and *goela tumboe* or of imitation *gur* in the sense of sugar mixed in varying proportions with molasses. It is impossible to estimate with any degree of precision the prices at which such sugar products are likely to be imported in the future particularly as molasses is a byproduct of the sugar industry depending for its price largely on the exigencies of the market. Nor is it possible to determine on a strictly commercial basis the minimum price at which the manufacture of Indian *gur* may be expected to sell his product. *Gur* is made generally by the small grower of cane to whom its manufacture as a profitable occupation depends not on the surplus earned by him over his aggregate expenses of production but rather on the return for labour which it provides as compared with other cash crops. Any accurate measurement on this basis of the limit of price at which the manufacture of *gur* would be profitable or not would prove illusory.

For the reasons given we are satisfied that the three conditions laid down by the Fiscal Commission are fulfilled and that the claim to protection of the sugar industry in all its branches except that of refining has been established.

CHAPTER IV.

The problems stated.

26. Although we have found that the sugar industry substantially fulfils the conditions laid down by the Fiscal Commission we desire to emphasize that the strongest aspect of the case for protection is that based upon the national importance of promoting the cultivation of sugarcane. The claim to protection from the industrial point of view has been discussed already. We now propose to consider the agricultural aspect of the case. It may be stated at the outset that the expansion of the sugar industry in India is an indispensable adjunct to agricultural development. At all times cane cultivation occupies a prominent position in the agricultural economy of India and particularly at the present time when owing to the general world depression the prices of almost all alternative crops have fallen to an unremunerative level. It is of the utmost importance that the area under cane should not diminish and the real problem before us is to provide an outlet for the larger quantities of cane which may be expected from the introduction of improved varieties.

Agricultural aspect of the case most important.

27. Throughout most of India cane occupies a recognised place in the system of rotation of crops. It may of course be replaced by garden crops such as chillies or tobacco or even in places by the staple crops rice, wheat or cotton. But if this substitution took place, on balance the agricultural system would be the poorer and the productivity of the soil less. The yield of crops grown after sugarcane is generally speaking considerably higher than that after other rotation crops. We have been told for example that in the United Provinces improved types of wheat grown after sugarcane give a yield of 30 maunds as against 20 maunds when the same type is grown after other crops. This improvement is not merely a question of the utilization of the manurial residue left in the soil after cane cultivation, but is a result of the general stirring up of the soil and deeper cultivation required for cane growing, particularly where intensive methods are followed. It is a well known fact that cane cultivation requires more intensive agriculture and better utilization of the resources of the soil than other crops. Some 200 tube wells driven by oil engines have been introduced in the United Provinces and the Director of Agriculture in a recent report has stated that they will only really be successful where some form of intensive agriculture exists. Any considerable setback to the area under cane must, by making intensification unprofitable, result not only in the retardation of agriculture generally but also in the discouragement of facilities for the development of ' garden ' crops which,

Crop yield after cane cultivation higher.

depending as they largely do on the home market, afford some safeguard to the agriculturist in these days of world depression when the price of all staple crops have fallen from causes beyond the control of the Indian Government.

28. This brings us to a very important aspect of the enquiry. As has been already stated, the present is a time of acute agricultural depression. The price of all staple agricultural products has fallen to levels which in some cases have not been reached for many years past. The extent of this depression may be seen from the following table:—

Cane—the one agricultural product for which Government assistance is possible.

	Price 1913.	Price 1929-30.	Current prices.
	Rs. A. P.	Rs. A. P.	Rs. A.
Wheat (Calcutta) Club No. 2 per bazar maund . .	3 15 2	5 10 9	3 0
Cotton (Bombay) Oomrawati per candy	286 8 2	298 5 9	156 0
Rice (Rangoon) per cwt. .	4 14 1	6 4 2	3 4*
Jute (Calcutta) per 400 lb. bale	77 15 3	71 4 0	34 0

The price of most staple crops in India depends on world causes since the home market is not sufficient to absorb the total production. But in the case of sugarcane the position is different. The imports of white sugar into India amount to nearly 1,000,000 tons. There is thus a market for a considerably increased production of cane in India provided that it can be made available for the manufacture of white sugar. There is perhaps no other agricultural product of equal importance in regard to which Government has the power to afford substantial relief by ensuring that so far as possible the home market shall be reserved for the Indian agriculturist, so that however greatly he may be affected by world causes as regards his other crops, one source may remain from which he may hope to obtain the wherewithal to pay his rent and irrigation dues and provide those necessaries of life for which cash payment is required.

29. Most of the local Governments stress the importance of cane cultivation in India not only from the point of view of the agricultural classes but also in connection with the provincial Governments' financial commitments. In view of the record fall of jute prices, a crop which in the past has been the main stay of the Bengal agriculturist, the maintenance or extension of sugarcane cultivation which may to some extent provide an alleviation for the present depression, is a matter of great importance to that province. In Bombay also any large contraction of the cane area must seriously embarrass the Govern-

Importance of cane crop to Provincial Governments.

* The figure is approximate. Later quotations ,Rangoon Big Mills Special give Rs. 212-8 per 100 baskets of 75 lbs. each.

ment. A very large sum of Government money (Rs. 9 crores) has been sunk in the construction of the Deccan irrigation canals. The revenue derived by way of irrigation dues is about Rs. 26 lakhs of which sugarcane pays over Rs. 10 lakhs. Clearly in these tracts an expansion of the sugarcane area is desirable and any considerable diminution must result in a fall in the irrigation revenue derived from these works. Generally it may be stated that since cane is at the present moment the only cash crop which has not fallen heavily in price, the ability of the cultivator to pay his rent and other dues is conditioned largely by the maintenance of cane and *gur* prices, while any serious permanent decline in the area under cane must affect both the return which may be expected from existing irrigation works and in many parts also the prospect of economic development of irrigation schemes in the future.

Cane an important cash crop.

30. We have been at some pains to examine the position which cane occupies as compared with other crops. As we have already stated, in present conditions it is the one remaining crop on which the cultivator relies for his cash requirements. But even in more normal conditions it is still the most important of what may be termed the cash crops. On this all agricultural experts who have given evidence before us are agreed. There have been occasions when other crops, for example, cotton, owing to an exceptionally high level of prices, have given a profit per acre in excess of that obtained from cane. But generally speaking in the past over a period of years the return from cane has been consistently greater than that from any other crop except jute. It is true that garden crops such as chillies are at times most profitable, but the market for such produce is limited and easily glutted, so that at the best the cultivation of such crops on any considerable scale is highly speculative.

Cane crop a source of cattle fodder.

31. An important aspect of cane cultivation which is often overlooked is in connection with the supply of cattle fodder. It is estimated that one acre of cane supplies one and a half tons of cattle food in the shape of tops and edible leaves. So valuable is this considered that it is the usual practice to undertake the stripping of cane free, the workers' remuneration consisting of the right to appropriate the tops and leaves. The reaping of cane commences in November and extends as a rule up to the middle of March. It thus occupies the interval between the *kharif* and *rabi* harvests and serves to afford employment to the agriculturist and his cattle at a time when other employment is scarce.

Summary of conclusions regarding importance of cane crop.

32. It will be useful here to summarize our conclusions regarding the importance of cane cultivation in the agricultural system of India. Sugarcane occupies a definite place in the crop rotation of this country which it would be difficult to fill if any considerable reduction in the area oc-

curred. Its cultivation is followed by increased yields of other crops sown in rotation with it, partly as a result of the residual effect of the manure used in cane cultivation but largely also on account of the thorough stirring up and aeration of the soil which is a feature of the intensive cultivation required if heavy crops are to be obtained. It is also of great importance as a source of cattle fodder at a time when the supply of grass has begun to decline. At all times it occupies a prominent position in agricultural economy as being one of the few crops on which the cultivator relies to meet his cash requirements and at the present time, when the prices of other agricultural products have fallen to very low levels, the importance of maintaining the area under cane and its prices cannot be over-estimated. The payment of rent and irrigation dues depends to no small extent on this crop and any serious setback to its cultivation would not be without effect on the finances of at least some of the local Governments. The development of well irrigation as a condition precedent to intensive cultivation would present serious difficulties if no cane were grown and in the heavily populated tracts its cultivation may be regarded as essential to agricultural improvement. Finally it is the one crop for which, if it can be utilized for the manufacture of white sugar, the home market is more than sufficient. While it is beyond the power of Government to control the prices of other agricultural products, since these depend on world conditions, in the case of cane it is possible to ensure the maintenance of a reasonable price level by protecting the *gur* market against foreign competition and by providing an outlet for any surplus cane produced by the development of the white sugar industry.

Number of persons dependent on cane cultivation.

33. It is difficult to estimate the number of people who are partly dependent on cane cultivation. Mr. Burt, the Agricultural Adviser to the Imperial Council of Agricultural Research, has tentatively advanced the view that about 13 million people are directly interested. The estimate assumes that one acre of cane represents on the average the area grown by a family which is taken as consisting of from four to five members. Very much smaller areas than this are grown and the estimate does not appear to be excessive. Such additional hired labour as is employed in weeding, harvesting and the allied manufacture of *gur* has to be added. It would not therefore appear unreasonable to assume that not far short of 15 million people are directly concerned in the cultivation of cane.

Exclusion of foreign *gur* and low grade sugar desirable.

34. In view of the considerations set out above, it would appear that apart from any question regarding the economic gain to the country resulting from the substitution of Indian made for imported sugar, the maintenance and extension of the area under sugarcane is at all times a matter of definite national importance and particularly so at the present time of agricultural depression. There are two main outlets for the cane produced in India. The first and most important is the manufac-

ture of *gur* and the second, at present small but increasing in importance, is that of white sugar. Here we propose to discuss the present position of the *gur* industry, reserving for a later stage the consideration of the manufacture of white sugar. Of the total cane grown in India which, taking the minimum output of 10 tons an acre, may be placed at between 25 and 30 million tons annually, about 72 per cent. is utilised for *gur* manufacture. Assuming that the demand for *gur* remains unchanged, any import of *gur* from Java or manufacture of imitation *gur* from imported sugar must result in a decrease in the acreage under cane in India. Our first step therefore must be to secure the market for Indian *gur* by taking such measures as will ensure not only that no foreign *gur* is imported but also that the manufacture of imitation *gur* from foreign sugar becomes definitely unprofitable.

Factors limiting supply of *gur* in past.

35. But this in itself would not be sufficient to safeguard the position of the Indian agriculturist. In the past there have been definite factors limiting to a very considerable degree the possibility of any well defined increase in the outturn of sugarcane. Conditions such as the possibility of irrigation, the financial resources of the cultivator and the necessity of growing food crops, have prevented larger areas being set aside for cane cultivation. Though there have been annual, often considerable, fluctuations, speaking generally it may be said that in the last 20 years the area and in consequence the outturn of sugarcane has been remarkably steady. As a result of those limiting factors to which reference has been made, even in the years immediately succeeding the war when *gur* prices reached very high levels, there was no proportionate increase in the area under cane. In 1920-21 the wholesale price for *gur* may be taken as not lower than Rs. 10 per maund on the average throughout India though in different localities particularly near the port towns much higher prices have been given as will be seen from the following figures:—

Market prices of *gur* in ports.

Year	Bombay.	Madras.	Calcutta.
	Rs. A.	Rs. A. P.	Rs. A. P.
	per maund.	per maund.	per maund.
1920 . . .	21 0	15 5 0	...
1921 . . .	18 0	13 8 0	...
1922 . . .	17 0	10 15 0	...
1923 . . .	14 14	9 7 8	...
1924 . . .	14 0	11 5 0	11 2 7
1925 . . .	15 8	10 3 5	9 10 6
1926 . . .	13 12	9 7 8	9 1 6
1927 . . .	13 0	8 12 0	9 15 5
1928 . . .	12 8	8 6 2	9 12 0
1929 . . .	13 2	10 15 0	8 10 1
1930 . . .	11 9	9 7 8	8 6 5

But in the two succeeding years, 1921-22 and 1922-23, the area under cane showed no exceptional variations.

Outturn of *gur* in 1927-28.

36. The highest acreage of recent years (3·1 million acres) was reached in 1927-28. Allowing an outturn in round figures of 30 tons per acre in Madras (106,000 acres) and Bombay (103,000 acres) and an average of 10 tons per acre over the rest of India, we obtain an outturn of cane of about 35·2 million tons. Following the Sugar Committee's (1920) figures of 2 per cent. of the crop as required for sets, a figure of 700,000 tons is obtained; to this has to be added the amount of cane required for chewing, 4,500,000 tons on the same authority. Not less than 750,000 tons of cane would be required for the 68,000 tons of white sugar manufactured in India in 1927-28. It is difficult to estimate the amount of white sugar made from *rab*. The Sugar Committee estimated the amount at about 250,000 tons annually; this figure is now considered a fairly close estimate. The *bel* process is largely employed in Rohilkhand where a very large proportion of the cane grown is used for the making of *rab*. The area under cane in Rohilkhand in 1927-28 was 335,000 acres. Taking the low yield of 10 tons an acre, we obtain an output of 33·5 lakhs tons of cane. Taking the return of white sugar per 100 tons cane given by the Director of Agriculture for a factory working on *bel* methods at Kheri, *viz.*, 5·25 per cent., we obtain a total output of nearly 176,000 tons of white sugar. It appears, therefore, that an estimate of about 200,000 tons of white sugar representing about 3,800,000 tons of cane is not an unreasonable estimate of the total amount of white sugar produced by this process. Of the total production of 35·2 million tons of cane in 1927-28 we find then the following amounts were used for purposes other than the manufacture of *gur*:

	Tons.
For sets	700,000
For chewing	4,500,000
For direct manufacture of white sugar . .	750,000
For manufacture of white sugar by *bel* process .	3,800,000
Total .	9,750,000

There is thus left for the manufacture of *gur* 25·45 million tons of cane. This should be sufficient to meet the normal demand for *gur*, since in no recent year has demand been in excess of this figure.

Outturn of *gur* if improved varieties of cane introduced.

37. Taking the output of deshi cane on the average as 10 tons per acre, the introduction of improved varieties of cane bred at the Coimbatore Research Station has resulted in a minimum increase of this crop by 50 per cent. Crops have been recorded on not unusually fertile land of as much as 30 tons an acre. An outturn of 15 tons an acre from Coimbatore varieties of cane is, therefore, a very conservative estimate.

Taking the area under cane as 3·1 million acres, if Coimbatore canes completely replaced the deshi varieties and leaving the output of cane in Bombay and Madras unchanged at 30 tons an acre, a total output of about 50 million tons of cane would be reached. Assuming that no steps were taken to increase the output of white sugar, which therefore remained constant, to obtain the quantity of cane available for *gur* manufacture it will be necessary to subtract 9·75 million tons of cane required for other purposes. We thus obtain a figure of about 40 million tons of cane available for *gur* manufacture as against 25·45 millions available in 1927-28, an increase of approximately 57 per cent.

Result on *gur* market.

38. If the whole cane area in India were under Coimbatore varieties, theoretically either of two results might happen. Prices might be maintained, and the area under cane be reduced possibly by as much as 800,000 acres, if there were no increase in the demand for *gur*, or on the other hand the area might be maintained in which case prices would completely collapse. Actually the reaction of supply and demand would work in both directions; prices would decline and at the same time the area under cane would fall. But, as always happens, there would be delay in the adjustment of area to price and it is probable that there would be a period of acute depression in the *gur* market, resulting in great hardship to the cultivating classes before agriculture adjusted itself to the new conditions.

Effect on *gur* market of introduction of improved varieties obscured.

39. The area under Coimbatore canes has been rapidly extending. The following figures have been obtained from the Sugar Bureau at Pusa:—

Year.	Area under improved varieties of cane in India.
	Acres.
1923-24	50,604
1924-25	75,334
1925-26	171,808
1926-27	207,989
1927-28	268,688
1928-29	219,466*
1929-30	362,709†
1930-31	817,094

It may be thought that with an area under improved varieties of cane of between one quarter and one-third of the total, the tendencies to which we have referred would already have manifested themselves. We are by no means sure that such is not the case. It is true that such figures regarding *gur* prices as are available

* Figures for Bihar and Orissa, United Provinces, Punjab and Madras only.

† Figures for United Provinces and Bihar and Orissa only.

to us show no very marked decline in price. But the official figures are not sufficiently accurate to admit of deductions being drawn with safety regarding the tendency of prices from year to year. Indeed, practically every Director of Agriculture who has given evidence has warned the Board against placing any great reliance on the record of prices published in the various Government Gazettes. From the evidence which we have received we believe that at present there is a distinct downward tendency in price. This would have been already more pronounced had there not been counteracting influences at work. The area under cane has been recently declining, having fallen since 1927-28 from 3,103,000 acres to 2,504,000 acres in 1929-30. More important than this, however, is probably the fact that, save in the United Provinces and Bihar and Orissa the cultivation of improved cane has been over widely scattered areas, thus obscuring the effect on the general level of *gur* prices in the country. For the largest area of improved varieties of cane is in the United Provinces, the returns for which are as follows:—

	Acres.
1928-29	140,216
1929-30	281,134
1930-31	514,691

The percentage of the area under improved varieties to the total area under cane is highest in the Rohilkhand Division amounting in one district to 78 per cent. The following statement shows how improved canes are concentrated in the principal cane growing tracts in the United Provinces:—

	Area under improved cane. 1929-30.	Percentage of total area under sugarcane.
Meerut	38,150	27·4
Bulandshahr	15,866	38·4
Muzaffarnagar	41,210	44
Saharanpur	13,251	28·2
Shahjahanpur	30,093	61·9
Pilibhit	36,144	78·7
Bareilly	46,642	70·4
Kheri (Mahanadi tahsil)	15,084	69·7
Hardoi	8,180	28·5
Gorakhpur	21,908	19·9

In Rohilkhand very little *gur* is made, practically all cane being used for the manufacture of *rab*, from which deshi white sugar is made in small centrifugal. There are 335,607 acres under cane in Rohilkhand and there has thus been an outlet other than the manufacture of *gur* for the increased output in the most important area under improved canes.

40. With 800,000 acres under improved cane in the current year it appears to us that a crisis is fast approaching for the *gur* industry and with it the cultivation of cane. The prospects are the worse in that with the present low prices of all other crops the cultivator, so far as natural conditions allow, must turn his attention to an extension of cane cultivation. In Bengal the Agricultural Department is advising the cultivating classes to substitute cane for jute, and since irrigation is not essential in Bengal, a considerable increase in acreage may be expected. With the high profits made by jute cultivation this crop replaced cane very largely at the end of the last and the beginning of the present century. In 1899-1900, the area under cane in Bengal was 884,400 acres against 507,800 in 1909-10. These figures include the outturn both in Bihar and Orissa and Assam, the combined total of which in 1928-29 was 323,000 acres. The acreage under cane in Bengal in 1928-29 was 196,000 acres. It is obvious, therefore, that there is scope for expansion in Bengal. In Madras also it will appear from the Director of Agriculture's note (Appendix II) that the tendency is towards replacing the staple rice crop by garden crops. The same tendency must manifest itself in other provinces also.

Crisis in *gur* market approaching.

41. About half the area under cane in India (1,357,000 acres) is in the United Provinces, of which in the current year about 500,000 acres are under improved varieties of cane. In Bihar and Orissa the acreage under cane is 287,000 acres of which about 70,000 are under improved varieties of cane. It appears to us that in about three years practically the whole area in these two provinces will be under improved varieties. The United Provinces and Bihar and Orissa are the two large *gur* exporting provinces. As we shall see, the cost of cane cultivation is lower in these provinces than in any other part of India. Further, until recently all the efforts of the cane research authorities at Coimbatore were directed towards producing a cane suitable for conditions in Northern India and canes such as Co. 213 and Co. 214 as might be expected do not give such good results in Bombay or Southern India having regard to relative costs of cultivation. The United Provinces, Bihar and Orissa and to some extent the Punjab are thus at a definite advantage as compared with the rest of India in regard to *gur* manufacture. As we have stated, Bihar and Orissa and the United Provinces are exporting provinces, supplying with *gur* markets in the Punjab, Central India, Bombay and until recently Bengal. We have been told that the price of *gur* has already been affected in Bombay by imports from the United Provinces, while one *gur* merchant whom we examined ascribed the fall in the price of Coimbatore *gur* some two or three years ago to competition in the Bombay market from Northern India. Now, if in three years' time the whole of the area in the United Provinces and Bihar and Orissa (some 1,600,000 acres) is under improved

Effect of rapid spread of improved cane in United Provinces and Bihar and Orissa.

varieties, we may expect an increase in output of cane of not less than 50 per cent. Allowing for the area already under improved varieties (in 1929-30 362,709 acres), an increased output of cane of not less than 6·2 million tons may be expected. Other forms of cane consumption remaining constant, this would mean an increase in the production of *gur* of over 600,000 tons. If this additional amount is to be disposed of in the Indian market prices must fall heavily. In circumstances of this nature no gradual fall corresponding to the increased production can be expected. The indications are that unless steps are taken to meet the situation a disastrous slump may be expected, seriously affecting the agricultural class, disorganising the agricultural system and compelling cane cultivation to be abandoned on large areas.

Provinces affected differently.

42. We do not believe that a slump of this nature will affect all provinces equally. Since Northern India has the advantage of low cultivating costs, while the Coimbatore canes so far produced are peculiarly suited to natural conditions in those tracts, it is probable that the area under cane will be maintained or at any rate will fall far less rapidly than in other parts of India. The full force of the depression will be felt in the first instance in Bombay and Madras, where cultivating costs are high and no great progress has been made in the selection of suitable varieties. In these provinces and to some extent in Bengal it is probable that the area under cane will decline rapidly with the unfortunate results on agriculture in general to which reference has been made in an earlier portion of this Chapter.

White sugar manufacture essential as an outlet for surplus cane.

43. If a serious disturbance of the agricultural system in India is to be avoided and ordered development ensured, it is necessary to find an outlet for the additional production of sugarcane which may be expected from the introduction of improved varieties. The first and most obvious outlet is the manufacture of white sugar. Here we have a home market capable of absorbing a million tons of sugar, for the manufacture of which 10 million tons of cane would be required. Already there are 29 factories in India the majority of which are situated in Bihar and Orissa and in the United Provinces, the provinces from which a general disturbance of the *gur* market is most likely to originate. With the exception of the Punjab, it appears unlikely in present conditions that any appreciable expansion of the white sugar industry is possible elsewhere. The cost of cultivation amongst ordinary agriculturists is too high in Madras and Bombay to make the production of white sugar profitable at any reasonable price. Holdings also are small and very scattered, and it would probably be necessary for a factory in these provinces to undertake cultivation of cane with a view to supplying the major portion of its requirements. The acquisition of sufficient land for this purpose is however a matter of great difficulty and it appears unlikely that there will be any great development in this direction. In Bengal

prospects are better and we have been told by the Director of Agriculture that in the Rajshahi district and possibly in parts of Rangpur and Bogra districts conditions are not entirely unfavourable for the establishment of factories. At the same time it must be recognised that factories in Bengal are deprived of the railway freight advantage which factories enjoy in Northern India at present and will be faced with the full force of foreign competition. A favourable factor in Bengal arises in connection with the sucrose content of the cane. In the tropical conditions of Bengal this is higher than in Northern India. It is also possible in Bengal to grow cane to a greater extent on unirrigated lands. We consider it not impossible that sugar factories may be successfully established in Bengal given a scale of protection adequate to support the industry in the United Provinces and Bihar and Orissa and although in present conditions any rapid development of the white sugar industry in Bombay and Madras appears unlikely, we cannot entirely exclude the possibility of agricultural conditions changing to a very considerable extent as a result of the world depression in agricultural prices. In our opinion the United Provinces and Bihar and Orissa, which together account for more than half the sugarcane area in India, afford the best prospects for the development of the Sugar Industry and since it is these provinces which constitute a potential threat to *gur* manufacture and cane cultivation in the rest of India, it is clear that efforts should be made to encourage the manufacture of white sugar in the United Provinces and Bihar and Orissa. The present output of white sugar from factories in these provinces is some 80,000 tons. Not less than 2 million acres throughout India are still planted with deshi varieties of cane. Assuming a minimum output of 10 tons an acre on this area, a 50 per cent. increase resulting from the introduction of improved varieties of cane would be sufficient for the manufacture of over 900,000 tons of white sugar. We do not contemplate that from the present area this amount of sugar could be obtained since there are practical difficulties connected with the distribution of cultivation. But it would appear desirable, if a crisis in cane cultivation is to be avoided, to take steps to ensure that the manufacture of white sugar should be increased to some 400,000 to 500,000 tons. It is clear, therefore, that any duty which is imposed on foreign sugar must be fixed at such a level as to ensure not merely the continuance of existing factories but the rapid establishment of new factories.

Khandsaris: Importance of maintenance of khandsari system of sugar manufacture.

44. Another determining factor in regard to the level of the protective duty is the price at which the khandsaris can produce sugar. The *bel* process which is followed by the khandsari and is largely practised in Rohilkhand, consists of manufacturing *rab* by boiling the cane juice in a series of open pans. The *rab*, or what would be usually termed massecuite, is then worked in centrifugals, sometimes manipulated by hand but more often by power derived from small oil engines, and the white sugar separated out. In paragraph 278

of their report the Indian Sugar Committee (1920) considered that there was no future for this process which they described as most wasteful. This opinion, we think, must now be revised. When the Sugar Committee reported, the percentage of white sugar to cane obtained by the *bel* process was taken at 4 per cent. The separation of the sugar crystals from the massecuite was by the crudest process which is thus described in the Committee's report—

> " These (bags of massecuite) are stacked in piles of twelve and are pressed down by the feet. The molasses exudes through the bags and runs off in small drains. This process lasts about eight hours after which the resulting product is removed from the bags to another room in the refinery where it is stacked to a depth of three or four feet on bamboos covered with reeds or cotton stalks. There it is covered with a layer of water weed known as *siwar*, which is renewed on alternate days. After a month's treatment in this way, the upper layer which has become bleached is scraped off. Further scrapings take place on alternate days, the renewals of water weed continuing during the process. Each scraping is darker in colour than its predecessor. The sugar made by this process is known as *khand*."

This process has now been replaced by the use of centrifugals and the extraction according to the information given by the United Provinces Government has increased to 5·25 per cent. In addition to white sugar a good second class *gur* is manufactured from the second massecuite. In the small scale factory for which the United Provinces Government have supplied us figures, the total production per cent. of cane was as follows:—

White sugar	5·25
Gur	3·58
Molasses	2·64
Total	11·47

which may be compared with the ordinary factory extraction in Northern India:—

	Per cent.
White sugar	9
Molasses	4
Total	13

While the process is undoubtedly wasteful, the loss is not so great as was supposed. Further, the factories are on a small scale, employing small power mills for crushing, open pan boiling and centrifugal machines driven by oil engines. They are, therefore, able to operate in the interior parts of the country where

lack of communications or cultivation in scattered areas render sugar manufacture by large central factories impossible at present. The United Provinces Government considers that in the period of transition such khandsari factories are essential to the development of the Sugar Industry. In our opinion the khandsari industry must undoubtedly play an important part in providing an outlet for the surplus cane. Nor is the cost of production by this method so great as might be supposed. Overhead charges are low and the cost of supervision negligible and this to a considerable extent makes good the loss incurred by low extraction. Capital cost is estimated at 6·79 annas per maund of cane crushed as against Re. 1 per maund of cane crushed in Centrals. The United Provinces Government has given it as its considered opinion that, with white sugar selling in the United Provinces at between Rs. 11 and Rs. 12 per maund, these small open pan factories can make a profit and afford to pay the cultivator about 8 annas per maund for his cane. The opinion put forward has been supported by figures for a small factory at Kheri and in view of the very detailed knowledge of the sugar industry in all its branches in the United Provinces possessed by Mr. Clarke, Director of Agriculture, United Provinces, it may be accepted as representing the most accurate conclusions available regarding the cost of production of sugar by this method. The output of sugar from this branch of the industry has been variously estimated. The Sugar Committee placed it at about 250,000 tons. This figure was later considered an overestimate but in view of the fact that this process is almost universally followed in Rohilkhand where the area under cane is over 300,000 acres, an output of 200,000 tons does not seem excessive. Khandsari factories are easily and quickly established and for many years to come must form an important outlet for cane in those parts of the country which are not as yet sufficiently developed to admit of the construction of central factories. It appears, therefore, that an effort should be made to support the khandsari system both as holding an important position in the agricultural system of the United Provinces and as constituting an outlet for surplus cane which may be produced in the next few years.

45. The third step which should be taken is to impose a duty on foreign *gur* and low class sugar at such a level as to ensure its exclusion and to fix the protective duty on white sugar in such a way as to discourage the manufacture of imitation *gur*. This does not mean that the price of *gur* must be maintained at a high level. For in order to obtain an outlet for surplus cane the consumption of *gur* must be encouraged. This end may most naturally be attained by decreasing the price and as we have seen this may be expected to occur as a result of increased crops following on the cultivation of improved varieties. We contemplate however not a sudden slump in prices resulting from competition from imported *gur* or overproduction of *gur* in India but an ordered development in which steps will be taken to ensure that the fall in prices shall correspond to some extent to the fall in the cost of

Protection of *gur* industry.

production. For this purpose, while it is necessary to encourage the manufacture of white sugar in those parts of India in which it may be most economically undertaken, it is also desirable to take measures elsewhere to stimulate the consumption of *gur*. Both in Bombay and Madras the cost of producing sugarcane and consequently the price of *gur* are far too high. On an average cane costs the ordinary cultivator at least 12 annas a maund to produce in Bombay and in Madras it ranges from 7 annas to 12 annas, while the price of *gur* stands frequently at Rs. 8 per maund, a figure considerably in excess of that prevailing in Northern India. The method by which the largest reduction in the cost of cultivation can be achieved is by the introduction and popularization of improved varieties of cane suitable to the tropical conditions of Madras and Bombay and we consider that no financial considerations should stand in the way of progress in this direction. But apart from this there are other directions in which we are advised that reductions in the costs of cultivation can be secured in these two provinces. It would clearly be outside the scope of this report if we entered on any detailed discussion of this aspect of the problem. Moreover, the matter is one which should more properly be dealt with by the expert departments in charge of agriculture in the various provinces. The main directions in which economy can be effected are in selection of setts, amount and kind of manure, amount of irrigation and the wrapping and propping of cane. The cost of propping alone in Madras amounts to over Rs. 100 per acre, corresponding to more than Re. 1 per maund in the price of *gur*, and if this expenditure could be avoided either by the production of a suitable variety of cane or by the adoption of variations in the method of cultivation, the resulting economy would, we believe, have no inconsiderable effect on consumption.

Other grounds for protection of white sugar industry.

46. It will be seen then that the protection and encouragement of the white sugar industry is of vital importance not only to those parts of India in which conditions favour its establishment, but also to those provinces where, though *gur* manufacture is practised on a considerable scale, the prospects of the development of the white sugar industry are not encouraging. It may be urged that the protection of the white sugar industry is desirable on other grounds also. Central factories in order to obtain fresh supplies of cane must be situated in rural surroundings. They thus afford very considerable employment to agricultural classes in the period between the *kharif* and *rabi* harvests when agricultural operations are slack. It is estimated that the average sugar factory employs from 200 to 300 men throughout the year and about 1,000 men in the working season. Taking the production of an economic factory at 4,000 tons a year, if an output of 400,000 tons a year were attained in India, this would mean the employment in rural areas of about 50,000 men. Protection may also be supported on the ground that the replacement of nearly a million tons of imported sugar by the home produced article will

result in the retention in the country of about 12 crores of rupees annually, which would otherwise be remitted to foreign countries. But the validity of this argument depends on the position which cane cultivation occupies in the agricultural system of the country. If it were not essential in the agricultural economy of India, if it could be replaced by another crop which on the whole in normal times would return greater profit to the agriculturist without diminution in the indirect advantages resulting from its cultivation, it is clear that it might be advantageous from the point of view of national economy to grow such a crop in place of cane. For it might well be argued that the proceeds of the sale of such a crop might suffice to cover the cost of cheap imported sugar and leave a balance of profit. While then the retention of money in India may constitute a subsidiary argument for protection of the white sugar industry, the case for protection really rests on the importance of cane cultivation in the agricultural economy of India and the measure of protection must be determined with reference to the changed conditions which have been and are being brought about by the introduction of improved varieties of cane resulting in a great increase in the crop outturn. It is necessary on general agricultural grounds to maintain or increase the area under cane and to secure this end an outlet must be provided for surplus cane. Unless steps are taken in this direction, a serious crisis must result in the *gur* industry as the result of overproduction, great hardship will be caused to the cultivators, while agriculture in general will receive a severe blow. Finally, cane is the only important agricultural product the price of which is not determined by world conditions, and Government therefore has it in its power at this time of severe agricultural depression to afford substantial assistance to the agricultural classes by protecting the sugar industry. In the next Chapter we shall endeavour to determine a fair selling price for white sugar but we wish to make it clear that this price must be fixed not only with reference to the costs of existing central factories but also with reference to the condition of the *gur* industry, the position of the khandsari sugar makers and the necessity of maintaining the area under cane cultivation.

CHAPTER V.

Costs and Fair Selling Price—White Sugar.

47. The price of sugarcane is the most important item in the cost of producing white sugar amounting to approximately two-thirds of the total cost of manufacture. Our first task, therefore, must be to investigate the level which should be taken for the price of cane. And since, as we have seen, the problem before us is mainly agricultural and the interests to be served are primarily those of the cultivating classes, it is not sufficient to ascertain the price at which cane can be obtained. It is necessary to go further and attempt to determine a fair selling price for cane, that is to say, a price which will give the cultivator a reasonable return for his labour and outlay, ensure that the area under cane is maintained, and guarantee adequate supplies of cane not only to existing factories but also to any new factories which may be started in suitable areas. No accurate information is available as to the normal level of cost of cane cultivation. It is obvious that where, as in India, soil conditions vary so greatly even within comparatively restricted areas, the problem must be one of peculiar difficulty. Further, where, as is normally the case, cane is but one of several crops grown, the valuation which must be placed on the work of the cultivator's own bullocks or even on the labour of the cultivator himself cannot readily be determined. In the course of an enquiry of this nature, we have neither the time nor the material sufficient to enable us to arrive at any conclusion for which the accuracy associated with the investigation of industrial costs may be claimed. In the following paragraphs we set forth such figures as we have been able to obtain from the Directors of Agriculture of the leading sugarcane provinces. Though no exactitude can be claimed for these figures, they give sufficient indications of the level of costs in the different provinces to justify certain general conclusions, while with the additional evidence obtainable from the costs of those factories which undertake their own cane cultivation, together with the conclusions which may be drawn from the level of *gur* prices and of the price of cane at factory, it is possible, in our view, to formulate proposals regarding the fair selling price for cane which may be considered to approximate to the requirements of the agricultural community.

Cost of Cane Production.

The following figures have been given to us for the Godavari
(*a*) Madras. District in the Madras Presidency:—

	Cattle pair (Re. 1).	Men (6 annas).	Women (3 annas)	Cost. Rs. A. P.
Preparatory cultivation—				
Ploughing 8 times	12	12	—	16 8 0
Digging along bunds and corners and levelling	—	5	5	2 13 0
Seed and Planting—				
Cost of setts 15,000 (5,000 lbs.) at Rs. 5 per 500 lbs.	—	—	—	50 0 0
Planting	—	12	12	6 12 0
Manuring—				
Preliminary application—10 tons of cattle manure, carting and application	2½	5	10	6 4 0
Cost of manure—				
20 carts at Re. 1 per cart	—	—	—	20 0 0
10 bags black castor cake at Rs. 6 per bag	—	—	—	60 0 0
Pounding and application	—	6	6	3 6 0
After cultivation—				
Hoeing 3 times	—	12	18	7 14 0
Fencing in summer	—	4	—	1 8 0
Trenching twice and levelling beds	—	50	10	20 10 0
Wrapping 7 times at 25 men per wrapping	—	175	—	65 10 0
Removing trash, etc.	—	—	20	3 12 0
⅓rd cost of 4,000 small bamboos at Rs. 50 per 1,000 and 1,000 large bamboos at Rs. 75 per 1,000	—	—	—	91 12 0
Carrying bamboos and propping	—	30	—	11 4 0
Irrigation, watching, etc.	—	—	—	10 0 0
Assessment including double water rates.	—	—	—	23 0 0
TOTAL				401 1 0

Output about 920 maunds of cane. Cost amounts to about 7 annas per maund.

In the above figures the cost of harvesting has not been included, as these are usually set off in whole or in part against the value of tops and leaves which the harvesters receive and utilize as cattle fodder.

The figures for cultivation of cane on the main Deccan Canals
(*b*) Bombay. have been given by the Agricultural Department, Bombay, as follows:—

Operation.	Cost. Rs. A.
1. Pulverizing, ridging, discing and loading	40 0
2. Bunding, making channel and dressing ends	12 8
3. Setts 12,000 or 8 per cent. on acre of cane of 33 tons	46 12
4. Cutting, supplying, arranging and planting	10 0
5. Weeding	20 0

Operation.	Cost. Rs. A.
6. Earthing up	10 0
7. Farm yard manure; 40 carts at Rs. 2-4	90 0
8. Cake groundnut; 12 pallas at Rs. 81 per ton	104 0
9. Sulphate of Ammonia 224 lbs. at Rs. 170 per ton	17 0
10. Powdering and applying	7 0
11. Water rate	50 0
12. Labour of irrigation	20 0
13. Cutting, stripping, bunding and carting	35 0
14. Interest at 9 per cent. on Rs. 375 (half annual investment)	33 12
15. Supervision	30 0
16. Rent (Rs. 90 for 3 acres of which two-thirds is debited to cane)	60 0
TOTAL	586 0

Output 73,920 lbs. cane = 901 mds. approximately. Cost per maund 10·4 annas.

(c) Bengal. Costs are stated to be roughly as follows:—

	Rs. A.
Labour	80 0
Bullocks	15 8
Setts	60 0
Manure	106 0
Rent	3 0
TOTAL	264. 8

Cane is grown mainly on unirrigated land and the outturn is stated to be 600 to 700 maunds per acre. Taking the lower figure the cost works out to about 7 annas per maund.

(d) Bihar and Orissa. The Bihar and Orissa Government state that the average cost of cultivation in North Bihar, the most important cane tract in that province, is about Rs. 130 per acre and the average outturn unirrigated is 300 maunds. This would bring the cost of cane as high as 7 annas per maund. The Bihar Planters' Association give the following figures for Co. 213 and 210:—

	Rs. A.
Planting and harrowing	15 0
Weeding, etc.	5 0
Hoeing, ridging, etc.	4 0
Digging cane roots	5 0
Planting	7 8
Setts	24 0
Harvesting	2 0
Manure 15 mds. oilcake at Rs. 2-8	37 8
Rent 2 years at Rs. 5	10 0
TOTAL	110 0

Outturn from these varieties of Coimbatore canes is taken by the Association at 375 maunds per acre. This gives a cost per maund of cane of 4 annas 8 pies. We have examined also the costs of certain factories cultivating large areas under Coimbatore varieties of cane in North Bihar and we find that for irrigated cane, the cost falls at between 4 and 5 annas per maund, while for unirrigated cane (provided the season is favourable) a somewhat lower cost is obtainable.

(e) United Provinces.

A very interesting memorandum on costs has been furnished by the United Provinces Government. The basis of the calculation supplied is the cost of growing cane at the Shahjahanpur Government farm which has been accurately recorded for a number of years. The figures are as follows:—

Actual expenditure on cultivation of Coimbatore canes (Co. 213 and Co. 214) on flat (a) *fertilizer with 10 mds. castor cake,* (b) *fertilized with green manure,* (c) *unfertilized.*

	1927-28.				1929-30.			
	(A)		(B)		(C)		(D)	
	10 mds. castor cake per acre.		10 mds. castor cake per acre and green manure.		No. fertilization.		Green manure.	
Area on which observations were recorded (Acres)	2·5		2·5		2·31		2·31	
	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
1. Ploughing and preparation of land	51	1 7	49	1 3	59	2 6	50	9 5
2. Manure	30	1 9	45	7 8	...		13	14 5
3. Sowing and seed	48	7 9	48	7 9	53	0 5	53	7 10
4. Irrigation	22	15 5	32	2 0	62	12 4	74	3 9
5. Hoeing	16	2 7	16	2 7	24	6 7	22	5 11
6. Harvesting	15	11 7	15	11 7	2	9 3	2	13 9
7. Watching	8	1 11	8	1 11	11	8 4	11	8 4
8. Share of repairs to dead stock, miscellaneous crop expenditure	4	11 6	4	11 6	7	1 9	7	1 9
9. Cost of production per acre	197	6 1	219	14 3	220	9 2	236	1 2
10. Yield of cane mds. per acre	765		934		638		881	
11. Cost annas per maund of cane harvested on field	4·12		3·77		5·52		4·28	

Actual expenditure for cultivation of canes of indigenous type on flat, fertilized with 10 mds. of castor cake per acre and with one irrigation.

	1926-27.
Area on which observations were recorded (acres)	5·1
	Rs. A. P.
1. Ploughing and preparation of land	51 10 10
2. Manure and application	27 12 0
3. Seed and sowing	42 11 0
4. Irrigation	12 9 8
5. Hoeing	22 3 8
6. Harvesting	23 8 7
7. Watching	9 11 11
8. Share of repairs to dead stock, miscellaneous direct crop expenditure	6 8 1
9. Cost of production per acre	196 11 9
10. Yield of cane maunds per acre	497 maunds.
11. Cost annas per maund of cane	6·34

It is pointed out that the statements do not include rent, while owing to the low discharge of wells at the farm, the irrigation rate is exceptionally high. The cost of bullock labour represents about 80 per cent. of the cost of preparation of the land and is, therefore, a very important item. The hours of bullock labour have been accurately recorded and the cost per hour of a pair of bullocks has been based on the total cost of maintenance per annum and the hours worked at the Government farm. This cost is probably higher than that incurred by the cultivator himself. In rural section publication No. 19 (Farm Accounts in the Punjab 1926-27) information is given regarding the upkeep of 7 pairs of bullocks on a farm of 118 acres farmed by direct cultivation and the conclusion arrived at is that the cost of a pair of bullocks per hour is 3·54 annas. Accepting this figure and making the necessary adjustments in the statements given above and at the same time taking the irrigation cost at the rate prevailing in the Sarda Canal area (Rs. 10 per acre) and adding rent at Rs. 25 per acre, the United Provinces Government summarises its conclusions regarding the cost of cane cultivation by the cultivator as follows:—

	Annas per maund.
1. Coimbatore canes fertilized with 10 maunds of castor cake per acre	3·97
2. Coimbatore canes fertilized with 10 maunds of castor cake per acre and green manure	3·48
3. Coimbatore canes without fertilization	4·53
4. Coimbatore canes fertilized with green manure	3·41
5. Canes of indigenous varieties fertilized with 10 maunds castor cake per acre	5·97

The general conclusion is reached that in the Sarda Canal area sugarcane containing 11½ per cent. sucrose and 14 per cent. fibre with a purity of 85 in January and February can be grown by intensive methods of cultivation at a cost of 4¼ annas per maund.

(f) The Punjab.

Since in the Punjab the only large Central factory is situated at Sonepat in Rohtak district and since, speaking generally, owing to climatic conditions the southern portion of the Punjab only offers facilities for white sugar manufacture, we give below the figures supplied by the Director of Agriculture, Punjab, regarding the cost of cane cultivation in the Rohtak district:—

CANAL IRRIGATION.

District Rohtak, Tahsil Sonepat Village, Thana Thurd.

	Rs.	A.
Sugarcane thin variety—		
Ploughing 3	6	0
Manuring 20 cart loads	20	0
Cartage	10	0
Labour for spreading	1	0
Seed and planting	15	0
Sett preparation	4	4
Sowing	3	0
Hoeing	35	0
Irrigation	10	0
Labour	1	12
TOTAL	106	0

The average outturn of cane over the whole province is about 300 maunds per acre and assuming this production the cost of cultivation would amount to about 5½ annas per maund.

Costs of producing cane determined.

48. The costs supplied to us by the United Provinces Government, in which province the Director of Agriculture (Mr. Clarke) has made a special study of the sugarcane problem, are very carefully worked out and reliable. In view of this fact and considering the range of costs supplied by the Governments of the United Provinces, Bihar and Orissa and the Punjab, we believe we should be justified in assuming that the cost of cultivation of sugarcane in Northern India is between 4 and 5 annas a maund. This figure is considerably below that in other provinces. It is however reasonable to base the fair selling price of cane on these costs, since the three provinces referred to above together produce more than two-thirds of the total output of cane in India. Further, the provision of a new outlet for cane in Northern India is most urgent since it is from that quarter that the danger to the *gur* market in the rest of India is most likely to eventuate. Finally, under existing con-

ditions the prospects of any rapid advance in the white sugar industry are most promising in these three provinces. We therefore propose to base our fair selling price for cane on a cost of cultivation of between 4 and 5 annas a maund.

Fair selling price.

49. It is obvious, however, that we cannot take this figure without qualification as the price which may reasonably be paid by factories to cultivators for their cane. In the first place, the calculation of costs (save in the costs supplied for Bombay) makes no allowance for the fact that the agriculturist lives largely on advances obtained before his crop is sold and some adjustment must be made on this account for the price he realises for cane. Probably an addition of about 3 pies per maund would not be too much on this account. Further, the cane has to be delivered at the factory. On examining the account of a considerable number of factories we find that 1½ annas per maund must be allowed on this account. Another factor which must not be overlooked is the possibility of damage to the cane crop on account of climatic conditions, disease or the attacks of wild animals. It is of course impossible to estimate on the available data the insurance required on this account, but allowing for all the factors referred to above, a reasonable estimate of the price at factory required to cover the expenses of the cultivator including the labour of himself and his family is 7 annas a maund. This figure would in normal times be barely sufficient to induce the cultivator to grow and supply cane to factories in those areas where they are well established. It would certainly not be sufficient to prevent land being diverted from the cultivation of cane to that of other crops when prices of the latter are favourable, nor to ensure that a sugar factory, established in an area where sugar manufacture has not as yet been undertaken, obtained an adequate supply of cane. If we allow one anna a maund profit on cane on an average output of 300 maunds per acre, this would give a return of Rs. 20 per acre. If Coimbatore varieties are grown and improved methods of cultivation adopted, perhaps 500 maunds might be obtained, giving a profit of rather over Rs. 30 per acre. From the figures supplied to us by the Director of Agriculture, Punjab, we find that the average profit at the Risalewala Farm for the year 1927-28 to 1929-30 were for wheat Rs. 39 and for cotton Rs. 70 per acre. Allowing for the fact that cane occupies a definite and important place in the agricultural system of the country and also that it is on the whole less liable to damage than other crops, it appears to us that in normal times to ensure that the cultivator retains a sufficient area under cane, a profit of at least 1 anna per maund is required. A fair price for cane would thus be about 8 annas per maund delivered at factory.

As compared with price for *gur*.

50. The matter may also be considered from another aspect. An alternative outlet for cane is manufacture of *gur* and a white sugar factory commencing operations in an entirely new area, if it were to obtain ample supplies of cane, must scale its prices with reference to the *gur* market. The wholesale prices for *gur* returned

by the Governments of the United Provinces and the Punjab are as follows:—

Punjab.				United Provinces, Cawnpore (arithmetical average January—April).			
	Rs.	A.	P.		Rs.	A.	P.
1922-23	5	12	0	1923	6	6	0
1923-24	5	8	0	1924	5	9	0
1924-25	6	11	0	1925	6	14	0
1925-26	7	2	0	1926	8	0	0
1926-27	5	15	0	1927	6	9	0
1927-28	5	6	0	1928	6	6	0
1928-29	6	5	0	1929	6	6	0
				1930	6	5	0
Arithmetical average	6	1	0	Arithmetical average	6	9	0

The prices given are for high class eating *gur*. We have verified from the returns of the sugar refinery at Cawnpore that the price of refining *gur* was considerably below this level, standing for the five years 1926 to 1930 at Rs. 4-11-2 per maund delivered at factory, Cawnpore. We have had occasion already to remark that the figures of wholesale prices for *gur* published by Government lay no great claim to accuracy. Further, even accepting the figures as they stand, the price actually obtained by the cultivator must be somewhat lower than the wholesale price. We find that the wholesale price obtained at the Risalewala Farm in the Punjab for the years 1927-28 to 1929-30 was Rs. 5-1-8 per maund. On the whole the evidence points to the fact that Rs. 5 per maund is approximately the price obtainable by a cultivator for good eating *gur* in Northern India in normal circumstances. The cost to the cultivator of manufacturing *gur* including hire of crushing mill and boiling pans is from 12 annas to Re. 1 per maund. The net price obtained for *gur* may thus be taken at between Rs. 4 and Rs. 4-4 per maund. The average extraction of *gur* per cent. of cane in Northern India may be taken as 10. A price of Rs. 5 per maund of *gur*, therefore, represents a sugarcane value of $6\frac{1}{2}$ annas a maund. Owing to the conservative character of the agricultural classes in India, it is indisputable that a sugar factory in a new area would for some years be compelled to offer a somewhat higher price for cane than that obtainable by *gur* manufacturers. Further, the cost of carriage to factory has also to be added which in most favourable circumstances would not be less than one anna a maund. It appears, therefore, that 8 annas a maund delivered at factory for cane would be a fair price to the cultivator and would ensure to a factory operating in an undeveloped area a satisfactory supply of cane. The figure has been accepted both by representatives of the Agricultural Department and by witnesses appearing on behalf of factories as fair for Northern India. We propose, therefore, to take this figure for the purpose of estimating the fair selling price for white sugar.

51. Before discussing the cost of manufacturing white sugar in India at the present time it is perhaps necessary to refer very briefly to the processes of manufacture. Any lengthy discussion on this subject is unnecessary for our present purpose and it will be sufficient to indicate very generally the methods of sugar manufacture employed in modern factories. The processes may be stated as follows:—

Process of manufacture of white sugar.

(*i*) Milling of cane.

(*ii*) Clarification of juice.

(*iii*) Evaporation.

(*iv*) Separation of sugar crystals in Centrifugals.

(*v*) Drying.

The cane is conveyed on an endless carrier to a series of revolving steel rollers, varying in number from 11 to 17. Occasionally as a preliminary the cane is passed between revolving knives and sliced into convenient lengths. This greatly assists the subsequent crushing operations. The first two horizontal rollers have deep groovings, the function of which is to break up the cane and prepare it for the subsequent crushing operations. After the crushing rollers the cane passes through a series of three roller mills, numbering from three to five. With a view to extracting the maximum amount of sucrose, water or dilute juice is poured over the bagasse at the later stages.

(*i*) Milling of cane.

After being strained of its coarser impurities the juice is drawn away for clarification. The standard methods of purification are as follows:—

(*ii*) Clarification.

(1) Defecation.

(2) Sulphitation.

(3) Carbonatation.

Defecation Process.—The raw juice is neutralized by the addition of sufficient lime, heated, boiled in open pans (defecators) and then allowed to flow into settling tanks where the impurities are allowed to settle. The clear juice is drawn off, the impurities in the form of scum and sludge being treated in filter presses in the same way as in the carbonatation process.

Sulphitation process.—In this process a larger quantity of lime is added to the juice which is then treated with sulphurous acid gas until neutrality is nearly obtained, heated and boiled in the eliminators, whence it passes to the settling tanks.

Carbonatation process.—A considerable quantity of lime is added, the excessive lime being neutralized by carbon dioxide gas which is pumped through liquor. The calcium carbonate formed by the chemical reaction carries down in the form of a granular precipitate most of the impurities present in the juice. When the reaction is complete, the liquor is pumped through filter presses where the juice is separated from the impurities which are arrested

in cotton cloths. The process is repeated in a second series of filter presses until a clear liquid is obtained. The impurities remaining in the filter presses are diluted with water and treated for the recovery of any remaining sucrose. Where white sugar is manufactured direct from cane, either the sulphitation or carbonatation process is employed, but not the defecation which is used for the making of sugar intended for subsequent refining.

(*iii*) Evaporation.

The clarified juice is next passed through a series of vacuum evaporators and thus concentrated. Where the double sulphitation process is employed, it is next treated again with sulphurous acid gas and passed to the vacuum pans. Here further concentration follows under vacuum during which granulation followed by the growth of sugar crystals takes place. The sugar mass (or massecuite) is then discharged into vessels and kept in motion and gradually cooled until separation of the sugar can be proceeded with.

(*iv*) Separation of sugar in centrifugals.

From the crystallisers the massecuite is allowed to flow as required into the centrifugal machines where the molasses is driven through the gauze linings in the basket of the machine, leaving the sugar crystals encrusted on the interior surface of the basket. The molasses is usually reboiled twice and passed through the centrifugals, a second and third grade sugar being recovered in each case.

(*v*) Drying.

After being removed from the centrifugal the sugar is dried in a devolving drum through which a current of hot air is passed and is then ready for packing.

By-products.

52. There are two by-products of sugar manufacture, molasses and bagasse. The former finds a ready sale in India for use in the preparation of tobacco. At one time it was used in considerable quantities for the preparation of spirit in distilleries, but demand for this purpose is declining. Bagasse or the residue of fibrous matter remaining after the cane has been crushed is used as fuel in the factory furnace. In an up-to-date factory with good practice no additional fuel should be needed for power or heating.

Type of factory.

53. We propose now to set forth what we consider are the reasonable costs of manufacture in India in a modern well equipped factory of economic output. But first it is necessary to determine which process such a factory should adopt. The carbonatation process is somewhat more expensive, costing perhaps 5 annas more per maund of sugar produced. On the other hand, the recovery of sugar is 2 per cent. more than that obtained by the sulphitation process while the sugar produced is whiter and should—but does not always—command a higher price. But the limiting factor in determining the process to be adopted is the possibility of obtaining limestone and coke for the manufacture of carbon dioxide gas at a reasonable cost. Since these materials are not available in all localities where

sugar factories may be established and the cost of transport would render manufacture by the carbonatation process uneconomic, it is necessary to assume that in our representative factory sulphitation is employed for the clarification of the juice.

Economic production of factory.

54. The economic production of the factory must next be determined. The size of sugar factories differs widely in various countries. In his "Economic Aspects of Cane Sugar Production" Maxwell gives the following as the average output of sugar per factory in different countries:—

Country.	Average annual output.
	Tons.
Cuba	26,000
Hawaii	18,000
Philippines	17,000
Porto Rico	15,000
Australia	14,000
Java	12,500
South Africa	9,500
Mauritius	5,500

We have previously had occasion to remark that cane after being cut rapidly loses its sucrose content. The economic output of a factory must, therefore, be largely conditioned by the proximity to the factory of sufficient quantities of cane. Where, as in Cuba, immense quantities of cane are available or where, as in Java, the factories control their own supplies of cane, a factory may be designed with advantage to secure a large annual output of sugar. Conditions are far different in India where cane holdings are small and scattered and *gur* offers an alternative market. There is difficulty in securing sufficient land for a factory to undertake its own cultivation and though in one or two cases, notably at the Belapur factory in Bombay, a considerable area of land has been secured, it would be impossible even with a greatly improved output of cane to obtain control of sufficient land to ensure an annual output of sugar which would approach that obtained in Cuba or Java. In view of these conditions and having considered the output and cost of existing factories in India, it appears to us that a factory with a crushing capacity of about 13 lakhs maunds of cane producing between 4,000 and 4,500 tons of sugar a year would constitute an economic unit in Indian conditions. In Appendix III are given the figures relating to the capital cost of such a factory. These have been supplied to us by Messrs. Begg Sutherland and Company and represent present market prices. The total capital cost may be taken at Rs. 13·5 lakhs or roughly Re. 1 per maund of cane crushed.

Recovery of sugar per cent. of cane crushed.

55. In Java the recovery of sugar per cent. of cane crushed is between 11 and 12 per cent. The latest figure which we have been able to obtain is 11·84. The sucrose content of the cane is, however, much higher than in India, varying between 13 and 14 per cent. as compared with an average sucrose content of

about 11·5 per cent. in Northern India. It is not, therefore, possible that the same recovery of sugar per cent. of cane can be obtained. When the Sugar Committee reported in 1920, the average recovery of sugar in Indian factories was 6·85 per cent. cane. Since that time there has been great improvement. The latest figure supplied to us by the Pusa Sugar Bureau as the average recovery for the United Provinces and Bihar and Orissa factories is 8·95 sugar per cent. cane. Allowing for the difference of the sucrose content of the cane this represents a recovery of 78 per cent. sucrose against the average of 85 per cent. sucrose obtained in Java. For the purpose of estimating costs of a typical factory in Northern India under present conditions, a recovery of 9 per cent. of cane may be taken. By the end of the protective period a recovery of 9·4 sugar per cent. cane should have been reached; this represents a recovery of 82 per cent. sucrose against the recovery in Java (Sulphitation factories) of 84·7; efficiency beyond this, though it may be reached in individual factories, could not safely be assumed for the average Indian factory.

Present costs of typical factory.

56. The following statement gives the figures for the costs of a typical Indian factory employing the sulphitation process crushing 13 lakhs maunds of cane annually with a recovery of sugar of 9 per cent. cane. For the reasons already given cane has been taken at 8 annas a maund. We have examined the costs of a large number of factories working in Northern India and the figures represent our conclusions as to the costs which may reasonably be expected in present circumstances.

	per maund sugar. Rs. A. P.
1. Cane at 8 annas a maund	5 8 10
2. Other raw materials	0 2 0
3. Labour	0 8 0
4. Power and fuel	0 1 3
5. Supervision, office charges and establishment	0 11 3
6. Current repairs	0 7 0
7. Packing	0 2 9
8. Miscellaneous (excluding interest)	0 10 0
	8 3 1
Deduct molasses at Rs. 1-8 at 4 per cent. cane (52,000 maunds)	0 10 8
TOTAL	7 8 5

All charges have been estimated on a comparison of the costs of various factories, allowance being made for exceptional circumstances. Where, as in the case of repairs and renewals, consider-

able differences occur from year to year, averages have been taken over a series of years. The following points require explanation:—

Item 2. *Raw materials.*—These include sulphur and press cloth for filters.

Item 5. *Supervision.*—This includes pay and travelling allowance of the European and Indian supervising and technical staffs, head office expenses, clerical establishment. Directors and Auditors fees.

Item 6. *Packing.*—Cost of packing in single bags only has been estimated. Fall in the price of gunnies since last year has been taken into account.

Item 8. *Miscellaneous.*—This excludes such charges as Bank or debenture interest, but includes Managing Agents' commission which has been taken at the usual rate of 7½ per cent. on profits.

Credit for molasses.

57. The average recovery of molasses for the United Provinces and Bihar and Orissa from figures given by the Pusa Sugar Bureau was 3·6 per cent. cane in 1929-30. This however includes carbonatation factories where the production of molasses is lower. In Java molasses output in sulphitation factories varies from 4·8 to 2·62 with a mean of 3·55 per cent. cane against a mean of 2·89 for carbonatation factories. With the quality of cane used in Indian conditions it is probable that the output of molasses will always be higher. We consider it safe therefore to take an output of 4 per cent. cane. The price of molasses varies greatly. At the moment it stands high, as much as Rs. 2-12 per maund having been obtained by some factories. We give below the weighted average prices obtained by seven factories in the United Provinces and Bihar and Orissa in the five years 1924-28.

	Price per maund. Rs. A. P.
1924-25	1 13 6·5
1925-26	1 11 5·3
1926-27	1 15 8
1927-28	1 7 11·1
1928-29	1 6 9·8

If the scheme of protection which we propose is successful and production increases considerably in consequence, competition will increase and prices decline. Factories will be compelled to sell farther afield and the net receipts will be smaller. We consider therefore that it would be unsafe even in the immediate future to take a higher price for molasses than Rs. 1-8 per maund.

Depreciation.

58. If the estimate of capital cost (Appendix III) is examined, it will be observed that roughly Rs. 10 lakhs is required for plant and Rs. 3·5 lakhs for buildings. On buildings the usual rate for depreciation may be taken, *viz.*, 2½ per cent. As regards plant it would appear that a some-

what lower rate is required than in most industries, since it is the invariable practice in the sugar industry to strip and completely overhaul plant and machinery in the off season and the annual charges for repairs and renewals charged in the works cost account are therefore high. A rate above 5 per cent. does not appear to be justified and this was agreed to by some of the representatives of factories who appeared before us. The charges for depreciation therefore are:—

	Rs.
5 per cent. on Rs. 10 lakhs	50,000
2½ per cent. on Rs. 3·5 lakhs	8,750
	58,750

Interest on working capital.

59. On examining the accounts of stores, stocks and outstandings of a number of factories it appears that on an average the amount of working capital required approximates to one-third of the season's output. The production of our typical factory (at 9 per cent. cane recovery) is 117,000 maunds per annum. Works cost we have found to be Rs. 7-8-5 per maund. The working capital required will therefore be about Rs. 3,00,000. Allowing interest at 7 per cent. we obtain an annual charge of Rs. 21,000. Head office charges and agents commission have already been included in the works costs.

Profit.

60. Nothing less than 10 per cent. per annum will attract capital to this industry. This on a capital of Rs. 13·5 lakhs gives an annual charge of Rs. 1,35,000.

Incidence of profit and overhead charges.

61. The total amount on account of overhead charges and profit may be stated as follows:—

	Rs.
Depreciation	58,750
Interest on working capital	21,000
Profit	1,35,000
	2,14,750

On an output of 117,000 maunds per annum this gives an incidence of Rs. 1-13-4 per maund.

Cost at end of period of protection.

62. We propose now to consider the fair selling price of white sugar made at a similar factory at the end of the period of protection. For reasons which we shall state later, we propose a period of protection of 15 years. It is impossible to estimate with any degree of accuracy what the fair selling price of cane will be at the end of that period. The opinion of the representative of

the Imperial Council of Agricultural Research who gave evidence before us was that improvements in methods of cultivation and in the variety of cane might result in a reduction in the costs of cultivation by 2 annas a maund. It may be pointed out also that improvements in transport and communications combined with a more concentrated cultivation of cane might result in no inconsiderable reduction in the cost of delivery at factory. On the whole, we think it safe to assume that a fair price at the end of 15 years would be 6 annas per maund of cane delivered at factory. We have already stated that improved factory efficiency should result in the recovery of sugar rising to 9·4 per cent. cane, a figure not far short of Java practice allowing for the difference in the sucrose content of cane. If 13 lakhs maunds of cane are crushed annually, the production of sugar would then be 122,200 maunds. The cost may thus be stated:—

	Cost per maund sugar. Rs. A. P.
1. Cost of cane at 6 annas a maund	4 0 0
2. Other raw materials	0 2 0
3. Labour	0 7 8
4. Power of fuel	*nil*
5. Supervision, office charges and establishment	0 10 11
6. Current repairs	0 6 7
7. Packing	0 2 9
8. Miscellaneous	0 9 7
	6 7 6
Deduct molasses 52,000 maunds at 4 per cent. cane at Re. 1 per maund	0 6 9
TOTAL	6 0 9

Most of the reductions in this table result from the improved recovery of sugar. A figure of Re. 1 per maund has been taken for molasses, since if even half the amount of sugar at present imported is supplied from local sources the market for molasses in the white sugar tract will be glutted and more distant markets must be sought resulting in lower net receipts.

Overhead charges and profit.

63. It is now necessary to consider the charges on account of overheads and profit. The charge on account of depreciation will remain constant at Rs. 58,750. Owing to the changes in output and works costs working capital will require some alteration. With production at 122,200 maunds and works costs Rs. 6-0-9 a maund one-third of the season's output amounts to about Rs. 2·5 lakhs. Interest at 7 per cent. gives an annual charge on account of working capital

of Rs. 17,500. Profit will remain constant at Rs. 1,35,000. The total charges may thus be stated:—

	Rs.
Depreciation	58,750
Interest on working capital	17,500
Profit	1,35,000
	2,11,250

On an output of 122,200 maunds this gives an incidence of Rs. 1-11-8 per maund.

64. The fair selling price of sugar manufactured in a sulphitation factory crushing 13 lakhs maunds of cane annually at the present time and at the end of the period of protection are compared in the following table:—

Fair selling prices compared.

	Present. Per maund sugar.	At the end of protective period. Per maund sugar.
	Rs. A. P.	Rs. A. P.
1. Cane	5 8 10	4 0 0
2. Other raw materials	0 2 0	0 2 0
3. Labour	0 8 0	0 7 8
4. Power and fuel	0 1 3	*nil*
5. Supervision, office charges, etc.	0 11 3	0 10 11
6. Current repairs	0 7 0	0 6 7
7. Packing	0 2 9	0 2 9
8. Miscellaneous	0 10 0	0 9 7
	8 3 1	6 7 6
Deduct value molasses	0 10 8	0 6 9
	7 8 5	6 0 9
Overhead charges and profit at 10 per cent.	1 13 4	1 11 8
Grand Total	9 5 9	7 12 5

The mean between these figures, viz., Rs. 8-9-1 we regard, subject to adjustment, as the basic fair selling price for Indian sugar during the period of protection.

65. The freight on sugar from Calcutta to Cawnpore is Rs. 1-4-6 per maund and factories situated at a closer distance to Cawnpore have therefore a certain advantage in the sale of their sugar as against that of the imported article. The extent of this advantage depends on the

Freight advantage.

distance of the markets in which the Indian manufacturer is able to dispose of his goods. The Pusa Sugar Bureau has supplied us with the prices obtained for first class sugar in 1929 of 19 Indian factories. Excluding the price obtained by the Belapur Factory, which was very much in excess of the average elsewhere, we find that the average price amounted to Rs. 9-7-3. In the same year the average price of imported sugar was Rs. 9-0-2. The difference between these figures (*viz.*, As. 7-1) may be considered to represent in the main the freight advantage of Indian factories in the United Provinces and Bihar and Orissa in this particular year. There are however other elements in this difference in price which must not be overlooked. There is at all times a sentimental preference for Indian made sugar and at times of political excitement, when strong national feeling manifests itself, a noticeable addition to the price of Indian made sugar results. It is probable that in 1929-30 some two to three annas represents this sentimental preference, though the fact does not admit of demonstration. In years of falling prices such as have occurred recently, there is usually also some lag in the adjustment of upcountry to Calcutta prices which to some extent explains the difference in price in 1929-30. In the following table we give the prices obtained for first class sugar by 8 factories for which we have returns for the last three years together with the average Calcutta prices of imported sugar:—

Factory No.	Price per maund. 1927-28.	1928-29.	1929-30.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
1.	10 12 11	10 5 6·8	9 13 3·5
2.	10 15 7·6	10 3 9	9 9 9·2
3.	10 2 10	9 12 11·6	9 3 8·7
4.	11 0 0·9	10 3 5·9	9 9 7·2
5.	10 8 5·7	10 1 1·9	9 6 10·5
6.	10 6 4	10 1 11	9 13 0
7.	10 13 11	9 12 0·2	9 4 0
8.	10 8 0	10 0 0	9 12 0
Total	85 4 2·2	80 8 10·4	76 8 3·1
Average	10 10 6·25	10 1 1·3	9 9 0·4
Calcutta average price for the year	10 7 5	9 12 0	9 0 2
Freight advantage	0 3 1	0 5 1·3	0 8 10·4

Witnesses representing different factories have informed us that the freight advantage may on the average be taken at from 4 to 6 annas a maund, and on the whole in view of the fact that the figures represent some sentimental advantage also we consider that at the present time four annas a maund is as much as the average factory in the white sugar tract could safely rely on in the way of freight advantage.

66. We have carefully considered whether the fair selling price for Indian sugar should be reduced by this amount and we are definitely of opinion that no adjustment should be made on this account. At present about 89,000 tons of white sugar is manufactured in central factories in India. Of the output in the white sugar tract it appears from the accounts of sugar factories which we have scrutinized that about 60 per cent. is disposed of in the United Provinces where a definite freight advantage exists. If, as we expect, as a result of the scheme of protection which we propose a great impetus is given to the white sugar industry, new factories spring up and output increases, competition must rapidly reduce any freight advantage which is enjoyed. Prices in the local market cannot be maintained, while manufacturers will be forced to undertake sales in more distant markets where the margin of profit is less. Towards the end of the period of protection, it appears not improbable that Indian manufacturers will on the whole find themselves competing with imported sugar with the balance of advantage in regard to railway freight against them. Further in our proposals we are making no allowance for contingencies and in particular against climatic conditions injuriously affecting the crop and consequently the working of factories. The frost which occurred in the early months of 1929 resulted in a loss of about Rs. 3 lakhs to the Belapur Sugar Factory and although in the case of the factory which grows its own cane the loss from injury to crops is much higher than in the case of factories purchasing cane, even for the latter crop conditions may involve serious loss. For with a short crop, prices for cane must rise, while intermittent working seriously affects the efficiency of the factory. Costs may also rise in an unfavourable year as the result of the lower sucrose content of the cane. It appears reasonable therefore to set off any possible freight advantage in the early years of protection against the risk of crop disease and of adverse climatic conditions which an agricultural industry cannot avoid. In these circumstances it appears to us that it would be unsafe to make any adjustment in the fair selling price of Indian sugar on this account. Further, it is mainly in Northern India that any considerable freight advantage exists. In Bengal, it is probable that the balance of advantage would be in favour of importers. Although no sugar factories have yet been started in that province we should be averse to taking any step which would militate against the establishment of the industry in a part of India where in many respects climatic conditions are favourable to cane cultivation.

No adjustment for freight advantage.

67. Of the total quantity of white sugar manufactured in India about half is of second quality and white first quality sugar sells at approximately the same price as imported sugar, second grade sugar commands a price lower by 8 annas a maund. If on the average the Indian manufacturer is to obtain the fair selling price which we have estimated for the whole of his output, it will be necessary to adjust the duties in such a manner that imported

Adjusted fair selling price.

sugar and in consequence Indian first grade sugar sells at four annas above that level. In other words for the purpose of calculating the duty the fair selling price must be raised by four annas. We propose, therefore, that the basic fair selling price for the period of protection should be taken at Rs. 8-13-1 per maund.

CHAPTER VI.

Import prices: Method and amount of protection.

68. During the last decade the world's price of sugar which governs the price of sugar in India has been steadily falling. In the table below we give the Calcutta prices and the duty included for the last ten years:—

Present market prices.

Year.	Price per maund.	Duty per maund.
	Rs. A. P.	Rs. A. P.
1920-21 . . .	29 14 0 at 10%	2 11 8
1921-22 . . .	16 8 4 at 15%	2 2 5
1922-23 . . .	15 9 9 at 25%	3 2 0
1923-24 . . .	18 0 8 at 25%	3 9 10
1924-25 . . .	14 1 7 at 25%	2 13 0
1925-26 . . .	10 13 9 Specific Duty.	3 4 9
1926-27 . . .	11 13 11 ,, ,,	3 4 9
1927-28 . . .	10 6 0 ,, ,,	3 4 9
1928-29 . . .	9 12 6 ,, ,,	3 4 9
1929-30 . . .	9 0 2 ,, ,,	3 4 9
1930-31 (five months only) . . .	8 15 5 ,, ,,	4 6 5

The lowest prices have been reached in the current year. In April the Calcutta price stood at Rs. 9-1-6 per maund. Since then prices have until recently steadily declined. The lowest price reached was Rs. 7-15 per maund but the prevailing price has been Rs. 8-1 to Rs. 8-2 per maund. With the discussions at Brussels between representatives of the various sugar producing countries with a view to stabilization of price, some improvement was noticeable and the Calcutta price rose to Rs. 8-5 per maund. At the moment the Calcutta price stands at Rs. 8-5-6. In order to arrive at the c.i.f. price the duty (Rs. 4-6-5 per maund) must be deducted. Landing, clearing and agents charges amount to 3 annas a maund and these must also be allowed for. A Calcutta price of Rs. 7-15 therefore represents a c.i.f. price of Rs. 3-5-7 per maund.

69. In previous enquiries it has been the practice of this Board in estimating the measure of protection required by the industry under investigation to accept the current landed price, subject to such adjustments as can be foreseen, as the price likely to remain in force during the protective period. Where, as in the Steel industry, the future course of prices was uncertain, it was proposed that power should be entrusted to the Governor General in Council to impose such additional duties as market conditions might render necessary. This method would not, we think, be entirely adequate in the case of the sugar industry. The fact that the present range of world prices for sugar is insufficient to return a profit to manufacturers and cane growers in the majority of sugar producing countries, is evidenced by the discussions which have recently taken place at Brussels between representatives of different countries with a view to the stabilization of prices, while

Necessity for investigating Java costs.

the report of the West Indian Sugar Commission amply demonstrates the serious position of the industry. If then we were to accept the lowest level of landed prices in India in the current year for the purpose of estimating the amount of protection required, it would in our view be inevitable that such protection would be excessive in the latter portion of the protective period. And although it appears probable that the international negotiations in connection with the stabilization of the price of sugar, which are now proceeding, are likely to be successful it is impossible to predict with certainty that any scheme adopted may not in the future break down. It is therefore important to ascertain so far as possible the approximate level to which Java, which is the main source of India's supply, might be prepared to reduce prices in the event of renewed international competition or the adoption of a price cutting policy directed against Indian manufactures.

70. In these circumstances it appears essential to attempt to ascertain, so far as this may be possible, the general level of costs of Java manufacturers and approximately the higher and lower limits which according to the condition of the market must have an important bearing on the course of prices. The materials available for such an estimate are admittedly scanty. For at no time has very full information been available in regard to Java costs while recently we understand that it has been decided that such information as has previously been available shall in future cease. The condition of the crops also must vary from year to year and the cost at any one factory similarly varies.

Average Java costs in 1926.

In a memorandum* to the Economic Committee of the League of Nations Prinsen Geerligs estimates the average cost of production in Java in 1926 as 2·47 cents per lb. The costs of one white sugar factory are also given and work out at 2·34 cents per lb. As this is nearly the same as the average cost, the factory may be taken as typical. The following are given as the costs:—

	(Guilders (=1*s.* 8*d.*) per quintal (220·4 lbs.)
Raw material	4·89
Wages (cutting and transport)	1·28
Cost of manufacture	·74
Packing	·81
Upkeep and repairs	·88
Overhead charges, rates and taxes	1·43
Carriage of sugar	1·56
Selling expenses	·06
Depreciation	1·22
	12·87

71. Since 1926 there has been great progress in sugar manufacture in Java, largely as a result of the introduction of the variety of cane known as P. O. J. 2878, partly also owing to increased efficiency of manufacture. According to the International

Estimate of general level of costs at present.

* League of Nations Publication No. C. 148, M. 57, 1929, II.

Sugar Journal the following are the average figures for 1926 and 1929 for 178 Java factories:—

	1926.	1929.
1. Cane area	444,038	486,799
2. Harvested tons	18,683,145	24,140,899
3. Cane yield tons per acre	42·08	49·59
4. Sugar per acre lbs.	9,782	13.205
5. Sugar recovery per cent. cane	10·38	11·82

Allowing for the increase in cane area, the increase in yield due to the introduction of the P. O. J. 2878 variety of cane is 18 per cent.. The sugar recovery per cent. of cane has increased from 10·38 to 11·82; this means less cane per quintal sugar produced, while the increase of cane per acre also means a proportional reduction in costs. Adjusting the price on this account, we obtain a cost of cane per quintal of sugar of 3·63 guilders.

The increase in sugar recovery per cent. of cane will also mean a reduction in the incidence per unit of all other charges except the items packing, selling expenses and carriage of sugar. Excluding those items and the cost of cane, we obtain a figure of 5·55. This should permit of reduction in the proportion of 10·38: 11·82, the resultant figure being 4·87. If without additional expenditure a greater tonnage of cane has been crushed, there will be a still further reduction in expenditure. From the account of 32 Java companies for 1919—1927-28 published as a Dutch Commercial Supplement and obtained for us by the Imperial Council of Agricultural Research, it would appear that such is the case. But to prevent any possibility of exaggeration, we consider it better to leave this source of economy out of account. There are other items in the cost account which require adjustment. It is not clear whether the item 'carriage of sugar' includes sea freight. In note (*b*) on page 33 of the report of the West Indian Sugar Commission, the average charge from *ex*-store to f.o.b. is given as 4½*d*. and we have substituted this figure. Another item which requires adjustment is the cost of packing; since 1926 the cost of gunnies has fallen by about half. We have allowed 2·9 annas as the cost of packing in Indian factories and we believe that ·45 guilders per quintal is a sufficient allowance on this account. The cost figures under present conditions may be restated as follows:—

	Guilders per quintal,	Rupees per maund.
Raw materials	3·63	1·50
Wages—cutting and transport	1·12	·46
Cost of manufacture	·65	·27
Packing	·45	·18
Upkeep and repairs	·77	·31
Overhead charges and taxes	1·25	·52
Carriage of sugar	·45	·18
Selling expenses	·06	·025
Depreciation	1·07	·44
	9·45	3·885

In the costs published in the report to the League of Nations, no credit has been given for molasses, presumably because up till 1926, very little molasses was sold, much of it being thrown away or sold at a nominal price. At the present time the price of molasses stands very high, and as much as Rs. 2 per maund and even more has recently been obtained by Java factories. At the same time many Java factories have sold forward at rates of 12 annas a maund and below. Further, we have taken for our typical Indian factory an average credit of Rs. 1-4 per maund during the protective period. For our present purpose, therefore, it appears safer to take the same figure for Java factories. The Java output of molasses is roughly one quarter that of sugar. A credit therefore of 5 annas must be allowed on this account, bringing the cost per maund to about Rs. 3-9. We have now to add the cost of freight to Calcutta (3 annas), and landing, clearing and agents charges (3 annas). On our calculation therefore Java should on the average be able to land sugar in Calcutta without profit at Rs. 3-15 per maund.

Possibility of price cutting.

72. It is not claimed that this figure represents the actual average cost of Java factories in any one year. At the same time in our opinion it does give a very fair indication of the possibilities of the situation. When intense competition prevails or when it is sought by a price cutting campaign to restrict the expansion of the sugar industry in other countries, the average level of costs is little guide to the market price. We believe that the average we have given is on the high side, since we have made no allowance for economies resulting from the increased quantity of cane crushed. A very moderate valuation for molasses has also been taken. It will be observed that the estimate contains an allowance of 8 annas per maund for depreciation and a similar amount for overhead charges. We have ascertained that practically all Java factories hold very large reserve funds, frequently exceeding to a considerable extent the capital of the Company. In times of stress, therefore, it is probable that most companies would forego allotment to depreciation and even possibly a part of other overhead charges. Even on the average costs therefore it would appear that as low a price as Rs. 3-6 per maund at Calcutta *ex*-duty is not beyond the bounds of possibility while the best factories could land at even less. Mr. Noel Deerr, an acknowledged authority on the subject, stated in evidence before us that in his opinion inferior Java factories could land sugar in Calcutta at about Rs. 4 per maund, the better factories at Rs. 3 per maund and if favourable sales were made elsewhere the best factories at Rs. 2-8 per maund. He has supplied us with an estimate of costs for the best Java factories of Rs. 3 per maund (Appendix V). The lowest price so far touched in the Calcutta market is about Rs. 3-8 per maund *ex*-duty and representatives of the trade whom we have examined anticipate lower prices if unrestricted competition continues. It appears to us therefore that if Java manufacturers desire to restrict the Indian sugar industry, they may fix a price even as low as

Rs. 3-4 per maund *ex*-duty Calcutta. It is also possible that if the international negotiations now in progress for the stabilization of sugar prices end in failure, world competition may drive prices down to this level.

The estimated landed price.

73. The period of protection which we propose is for fifteen years and we cannot suppose that the present depressed conditions in the sugar trade will continue for so lengthy a period. Moreover should a price cutting campaign be initiated with a view to restrict cane cultivation and sugar manufacture in India, it must exhaust itself in the first half of the protective period, by which time, if our proposals are accepted, Indian factories may be expected to have established their position and cane cultivation to have made very considerable advance. For the whole of the protective period, it is necessary in calculating the protection required to take a more normal price for imported sugar. Average costs of production are not a reliable standard of price in normal times. Price being determined by demand and supply, with increasing production in India we might expect over a long period that prices in India would approximate to the higher level of costs in Java. It has been stated repeatedly by authorities on the sugar industry that any increase in cane production per acre in Java was impossible and that further improvement in efficiency was not to be expected. In each case such forecasts have proved incorrect. We are not therefore inclined to assume that the limit of efficiency in Java has now been reached and in estimating the normal price over a long period, some allowance must be made for this. On the whole we consider that a landed price of Rs. 4 per maund at Calcutta may be considered a normal price throughout the period of protection. It is noticeable that it was not until prices in India had fallen to Rs. 3-11 or Rs. 3-10 landed at Calcutta that Java manufacturers were prepared to negotiate with Cuban sugar producers. A level of Rs. 4 per maund may not improbably prove remunerative, if not at present, at any rate over an extended period. Market opinion appears to be that if negotiations are successful for restricting production and segregating surplus stocks, a market price of Rs. 8-5 to 8-6 (corresponding to about Rs. 4 per maund *ex*-duty) may eventuate, but that in view of the possibilities of production, the uncertainty as to the future Russian output of beet sugar and the large stocks of sugar now held, any further increase in price cannot be expected. For the purpose of estimating the normal amount of protection required by the Indian Sugar industry, we propose to take a landed price for imported sugar at Calcutta of Rs. 4 per maund.

Method and amount of protection.

74. On administrative grounds it appears desirable that protection for the Sugar industry should be introduced by the imposition of duties rather than by the grant of bounties. In the latter case on audit grounds it would be essential that the production, and possibly polarization of the sugar, at each factory

should be checked and it will be therefore essential in the working season to maintain one Government Inspector at each factory. There are at present 29 factories and if the scheme of protection now put forward is successful this number should rapidly increase. The employment of the necessary staff would involve no inconsiderable expenditure and, since sugar factories work only for from four to five months in the year, it would be difficult to utilize the services of the staff at other times. The proper supervision of such staff might also present difficulties. It may be hoped that the output of white sugar in India will rapidly increase and with this increase the liability on account of a bounty would also be greater. It is difficult to foresee the rate at which the output of the industry will increase and in any one year Government might find itself faced with a liability which would necessitate considerable financial adjustments. It may be presumed that Government would be reluctant to undertake any indeterminate liability of this nature, but the most conclusive argument against the system of bounties is the position of the khandsari industry. If a bounty were sanctioned for sugar produced in large factories only, the price received by khandsaris for their sugar would be less by the amount of such bounty and this branch of the industry will therefore receive a serious set back. Since at the present moment the khandsari industry produces more than double the amount of white sugar produced by central factories in India, and since the area dependent on the khandsari industry represents not less than 1/9th of the total area under cane in India, it will readily be realized that the interests of cane cultivation would not be served by a step of this nature. Further, since the khandsari system is necessary in the transitional period before development in Rohilkhand enables it to be replaced by a system of central factories, any serious set back to the khandsari industry by affecting cane cultivation would eventually affect the prospects of the factory system of white sugar manufacture in that area. On the other hand, if a system of bounties were sanctioned for both central factories and khandsari manufactures, it would be quite impossible to arrange for a check on the output sufficient to satisfy audit requirements. Khandsari factories are very small affairs; they work intermittently and are scattered over wide areas. Any attempt to check production of such manufacturers would manifestly be impossible. A system of bounties is not therefore a practical proposition in our opinion and we consider that protection should be granted by the imposition of import duties. It has been found that the basic fair selling price for the period of protection is Rs. 8-13-1 and the normal import price has been taken at Rs. 4 per maund. The basic duty therefore required for the protective period is Rs. 4-13-1 per maund. This represents a duty of Rs. 6-9-3 per cwt.

Two duties proposed.

75. While accepting this figure as approximately the measure of the protection required, we do not consider that the best interests of the industry will be served by the imposition of a uniform duty throughout the protective period. For it is in the first stage that the industry

requires the most protection. Fresh money will not come into the industry unless the results attained are such as to indicate clearly to capitalists the profitable nature of the venture. Further it is important that new factories established in tracts where sugar manufacture is a novelty should be in a position to pay rates for cane sufficient to ensure adequate and constant supplies. It is in the early years before full efficiency has been attained that support is mainly required, while in the later years of protection, when considerable progress may be expected to be attained, a somewhat lower duty appears justified. It appears to us therefore that while maintaining the total amount of protection unchanged, it is advisable to propose two rates of duty, the higher rate for the early years and the lower rate for the later years of the protective duty. We suggest therefore that for the protective period of fifteen years a duty of Rs. 6-4 per cwt. and for the first seven years an additional duty of Re. 1 per cwt. should be imposed. The total protection thus granted is approximately the same as would result from the imposition of a duty of Rs. 6-9-3 for the whole of the 15 years period. A uniform duty for the whole period at this rate would, as we have stated, have the result of leaving the industry at the beginning of the period with less protection and at the end of the period with more protection than it requires. In an industry such as the sugar industry, where the difficulties of initial development are likely to be great, we consider that if possible the assistance granted should be allocated in such a way that the industry is enabled to surmount effectively those difficulties which may arise during the earlier period. It is for this reason that we have proposed the distribution of the average duty of Rs. 6-9-3 per cwt. into two duties of Rs. 6-4-0 per cwt. for fifteen years and an additional duty of Re. 1 per cwt. for the first seven years. We have found in the course of other enquiries that an average duty fixed for a long period does not meet the requirements of adequate development and we are anxious that due provision should be made for the sugar industry where the difficulties are above the normal.

Deferred Duty.

76. We have considered very carefully whether the additional duty should be further increased on account of the possibility of a further decline in import prices, either as a result of world competition or the adoption of a definite policy of price cutting by Java, directed against the Indian industry. When we commenced to draft our report, and before international negotiations for price stabilization of sugar commenced, it was our intention to recommend an addition of 8 annas a cwt. or 6 annas a maund. At the moment of writing it appears probable that these negotiations will be successful and market opinion inclines to the view that Calcutta prices will be stabilized at about Rs. 8-5 or Rs. 8-6 or about Rs. 4 without duty. We have therefore reconsidered the position. On the one hand we cannot overlook the fact that restriction schemes for other commodities, though to all appearance initially successful, have frequently failed in the past. The attitude and future output of

Russia is also uncertain and this alone may destroy the efficiency of the restriction scheme. Prices in Calcutta have already been as low as Rs. 3-8-0 to Rs. 3-9-0 per maund *ex*-duty as against a price of Rs. 4 taken by us in calculating the duty required, and, should the restriction scheme fail, such prices may again be expected. Again, the price policy which Java manufacturers may adopt in view of a growing Indian sugar industry, steadily replacing imported by Indian sugar, must have an important bearing on the case. Finally an addition of 8 annas in the duty represents an increase of 1/10th anna per lb. in the price and may well leave the retail consumer unaffected. With some hesitation we have decided to recommend no further increase in the duty. We recommend however that should the present negotiations fail, or should market prices in Calcutta in the future fall below Rs. 4 (without duty) either as a result of the failure of the restriction scheme or of a policy of price cutting adopted by Java manufacturers, an addition to the duty of 8 annas per cwt. should immediately be imposed and that powers be taken to that end.

Conditions for imposing deferred duty.

77. It is proposed that this off-setting duty should be fixed at a definite figure, and that no enquiry should be held to determine its amount. This we believe will have a less disturbing effect on trade. It is likely also to have a stabilising effect on prices since with the prospect of the imposition of this duty importers would endeavour so far as possible to maintain prices at not below the level of Rs. 4 a maund on which our proposals are based. The scheme now put forward is no new departure. It has its counterpart in the suspense or deferred duties in South Africa and also in Australia, though in the latter country the import of sugar is prohibited. It is not proposed that the discretion which, it is suggested, should be vested in the Governor General in Council to determine the occasion on which such duty should be imposed should be in any way limited. We desire however to indicate the conditions in which in our opinion its imposition would be necessary. These are as follows:—

(1) If the International negotiations for the stabilization of sugar prices fail;

(2) If the stabilization scheme though agreed to fails to effect its purpose;

(3) If prices as a result of a policy of price cutting directed by any country against Indian manufactures fall below the level of Rs. 4 without duty which we have assumed.

In none of these cases will any enquiry be necessary; for in the first case it would be a matter of common knowledge whether a stabilization scheme is adopted by the leading sugar producing countries. In both the other cases it should be possible to arrive at a conclusion merely on an examination of import prices and without a reference to the Tariff Board. We consider it important that when the need for an additional duty is established by an

examination of prices prompt measures on the lines we have indicated should be taken by executive action. It is however desirable that at the earliest opportunity subsequent to the imposition of such duty the sanction of the Legislature should be obtained for the continuance of the deferred duty and for the period for which it is to remain in force.

Price of molasses.

78. It may be urged that there is one circumstance which should normally give the Indian producer a somewhat higher price in the early years of protection than that represented by the fair selling price, *viz.*, that the present price of molasses stands higher than the level which has been taken in estimating the fair selling price. In regard to this it may be pointed out that whereas in calculating the fair selling price in the early years of protection a credit at the rate of Rs. 1-8 per maund of molasses has been allowed, in estimating the price at which Java sugar could be landed in Calcutta a credit at the rate of Rs. 1-4 per maund of molasses has been taken. The prices of molasses are very irregular, but so far as we can ascertain the upcountry price does not correspond to the landed price of Java molasses *plus* duty *plus* railway freight, but corresponds approximately to the Calcutta market price including duty. The difference of four annas per maund in the credits taken approximately covers freight from Java. Should the price of molasses continue high, factories both in Java and Cuba as their present contracts expire will be able to obtain higher prices for their molasses and a corresponding decline in sugar prices below the level which we have assumed may therefore occur. No adjustment or redistribution of the duty is, therefore, required on this account.

Effect of proposals in different provinces.

79. Although our proposals are based mainly on conditions in the white sugar tract of Northern India, we believe that they will be found generally suitable for factories in other parts of India also. It is true that in Bombay and Madras the cost of cane cultivation is much higher. But with intensive cultivation and modern machinery we believe that even at present cane can be produced at 9 annas a maund in Bombay. We have examined with care the cultivation costs of the Belapur factory in Bombay. We should mention that on the agricultural side this factory is extremely progressive and great attention is paid to the trying out of new varieties, the testing of manurial results and of new methods of cultivation. From an examination of the costs of this factory it would appear not improbable that cane will be produced eventually at little over 8 annas a maund. The sucrose content of the thick cane grown in Bombay is not less than 13·5 per cent. cane as against 11·5 per cent. cane in Northern India. There is no reason therefore why sugar over 11 per cent. cane should not be recovered. Thus in Bombay 9 maunds cane would be used to make one maund of sugar as against 11 maunds in Northern India. The duty which we have proposed for the first seven years of the protective period, *viz.*, Rs. 7-4 per cwt., is sufficient to permit of

cane being bought or produced by a factory in North India at just under 8 annas a maund. A Bombay factory, therefore, could afford to pay about 9 annas a maund for cane and produce at the same cost as a factory in the white sugar tract in Northern India. This factory enjoys a freight advantage of about 6 annas and since it is improbable that many new factories will be established in Bombay this advantage is likely to continue. Allowing even for unforeseen contingencies such as adverse climatic or crop conditions, it would appear that the duty which we propose for the first seven years is likely to be suitable for Bombay conditions. The same reasoning applies to Madras factories. We realise that the duties proposed would not make the manufacture of sugar profitable for a new company with the high rates for cane paid by the East India Distilleries Company at Nellikuppam. But this company relies largely on its distillery and to some extent its sweet factory for its profits; further, the value of the plant has been written down to a very low figure. It appears probable, therefore, that as regards the existing factory if the plant is brought up to date and efficiently worked, the duty of Rs. 7-4 now proposed for the first seven years of protection will enable it to work with a small margin of profit.

Effect of the proposal on khandsaris.

80. It has been previously mentioned that the khandsari system of sugar making must occupy a position of importance in the transitional period and the United Provinces Government has stated that with sugar selling at between Rs. 11 and Rs. 12 per maund the khandsari manufacturer will be able to obtain a fair profit while paying a reasonable price for cane, while at Rs. 9 he would lose so heavily that he would cease manufacture. If the duties which we have proposed are accepted, on a landed price of Rs. 4 per maund the Calcutta market price during the first seven years of protection becomes Rs. 9-5 per maund. The railway freight to Cawnpore is Rs. 1-4-6, but including terminal charges, interest, wastage *en route* and other additional charges, the total charge between Calcutta and Cawnpore amounts to Rs. 1-9. The price at Cawnpore thus becomes Rs. 10-14 per maund. In the first years of the protective period, therefore, the position of the khandsari will be safeguarded and no lower duty could be proposed without seriously affecting this important class of sugar manufacturer. We received evidence that the price paid for cane by khandsaris is based entirely on the price at which white sugar is sold and our proposals therefore should ensure a measure of prosperity for the agricultural classes in Rohilkhand, whose cane is almost entirely sold for white sugar making by the *bel* process. We attach considerable importance to this aspect of the case. Rohilkhand, where the khandsari system is mainly practised, has an area under cane of between one-ninth and one-tenth of the total area under cane in India. When developed it is likely to form one of the main centres for the establishment of sugar factories. Both from the point of view of the sugar industry, therefore, and also from the point of view of general agricultural

development, it is essential that adequate steps should be taken to maintain cane cultivation in Rohilkhand at its present level.

Period of protection.

81. We contemplate that the basic duty of Rs. 6-4 per cwt. should remain in force for 15 years. Progress in agriculture is necessarily slow, since cultivators are conservative by nature and it cannot be expected that improved varieties of cane will be introduced and improved methods of agriculture adopted as quickly in India as in other countries. It has taken years to ensure the cultivation of about one-third of the area of the United Provinces with improved varieties of Coimbatore canes, even though the Agricultural Department in this province has devoted special attention to demonstration work. Research work itself takes time and it must not be forgotten that research work in connection with thick tropical canes suitable for Madras and Bombay has only just commenced. At a later stage of this report we propose that increased sums should be allotted to development and research work, since without such measures the whole purpose of the protective scheme is likely to be delayed if not defeated. Indeed we regard this as almost a condition precedent to protection. Substantial assistance for development and research is required if progress is to be hastened. Even under the most favourable conditions it will take many years before the best varieties of cane are grown by cultivators throughout India and improved methods of cultivation introduced. If any real development in the Sugar Industry is to be secured, if new factories are to be established, land improvement and irrigation undertaken with a view to cane cultivation, it is essential that both the agriculturist and the industrialist should be assured of protection for a lengthy period and in our view no period of less than 15 years will suffice.

In addition to the basic duty of Rs. 6-4 per cwt. we propose for reasons already stated that there should be an additional duty of Re. 1 per cwt. This should remain in force for the first seven years of the protective period. At the end of that period sufficient progress in cane cultivation should have been made to enable factories to obtain adequate supplies of cane at a lower price, while the khandsari system of manufacture, if the scheme of protection is successful, should to a considerable extent give place to a system of central factories. We contemplate, therefore, that at the end of seven years this additional duty should automatically terminate.

Duties to apply to all classes of sugar.

82. It is proposed that the duties recommended should apply to all classes of sugar. Where the duty is a revenue duty, it is logical to charge a somewhat lower duty for inferior classes of sugar. Further if it were intended to encourage the refining industry, a lower duty on sugar used for refining might be justified even on protective grounds. It has however already been explained that under Indian conditions refining is not an economical process. Further the establishment of a refining industry utilizing as its raw material imported sugar must result in a reduc-

tion in the demand for Indian *gur* and so far as it successfully competes against Indian sugar factories, for Indian cane. It appears to us that on protective grounds there is no reason to discriminate between the different classes of sugar. Many of the classes of sugar below 23 Dutch Standard polarize at about the same level as 23 Dutch Standard and could be used as a substitute. If a lower duty were imposed on such sugar, the purpose of the protective duty would be largely defeated. Further the imposition of the protective duty on all classes of sugar alike will make the adulteration of *gur* by the admixture of lower grade imported sugar and the manufacture of imitation *gur* definitely unprofitable. In the interests of the agriculturist therefore as well as of those classes who on sentimental or other grounds desire to consume Indian *gur* only, this step is desirable. We propose also that the duty should apply to sugarcandy, a point to which our attention has been specifically drawn by the Government of India.

83. We would define molasses as containing not more than 35 per cent. sucrose. Anything in excess of this should be classed as sugar. A representation was received from Messrs. Carew and Company, Limited, Calcutta, alleging the existence of tariff inequality in regard to the manufacture of denatured or methylated spirit in India. The principal material from which the spirit is manufactured is imported molasses on which the duty is 25 per cent. while the duty on imported denatured spirit is $7\frac{1}{2}$ per cent. It was claimed that the duty on imported molasses used in the manufacture of denatured spirit should be remitted in whole or in part or in the alternative that the duty on molasses imported for distillation should be reduced to 15 per cent. *ad valorem*. The position may be explained as follows when the application was made:—

Claim for reduction in duty on molasses.

Tariff valuation of 1 cwt. molasses . . .	Rs. 1-10-6
Duty at 25 per cent.	6·625 annas.
One gallon denatured spirit imported . .	Rs. 1-1-0
$7\frac{1}{2}$ per cent. duty	1·3 annas.

Approximately 3 gallons of denatured spirit can be made from 1 cwt. molasses. The incidence of duty on Indian made denatured spirit is 2·208 annas against 1·3 annas for imported spirit.

84. To remedy this inequality the alternatives before the Board were either to lower the duty on imported molasses or raise the duty on imported denatured spirit. If the latter course were adopted, it would seriously affect the important lac industry, since denatured spirit is largely used in its manufacture. Representations have also been made that an increase in the duty on imported denatured spirit would be reflected in the varnish, paint and furniture polishing industries. On balance it would appear that the country would lose rather than gain by an increase in the duty on imported denatured spirit and we are definitely opposed to this proposal.

No ground for change in duty.

Since the application was first received, the position has much changed. The price of molasses has risen to about Rs. 2-12 a maund and even if the duty was completely removed, denatured spirit could not be manufactured in India from imported molasses to compete with imported spirit. Messrs. Carew and Company have therefore for the present withdrawn their application and we have no recommendation to make. It may be added that in our opinion the future of the denatured spirit industry in India depends on the development of the white sugar industry. If more sugar factories are established and production increases, competition will reduce the price of molasses to a reasonable level and the distilling industry will then be established on a far sounder basis than if it relied on raw material imported from abroad.

CHAPTER VII.

The Consumer.

85. Under the policy of discriminating protection as laid down by the Legislature an important consideration in determining the suitability of any scheme of protection is its effect on the consumer. It is necessary therefore to ascertain to what extent our recommendations if accepted will impose an additional burden on the consumer, what classes of the population will be mainly affected, and how far the sacrifice demanded is reasonable, having regard to the national interests which we hold in view. As regards the duty on *gur* and on inferior qualities of imported sugar we believe that the effect on Indian *gur* will be hardly perceptible. Up to the present very little *gur*, comparatively speaking, has been imported from Java and of this the larger part has been used for refining. *Gur* as such is not manufactured on any large scale in Java though, if manufacturers there considered it worth their while to undertake its production and a quality suited to the taste of consumers in this country could be evolved, a serious situation might arise. The duty therefore is mainly a precautionary measure. Its main result will be to exclude the small imports of Java *gur* now arriving and prevent the manufacture of imitation *gur* from low grade Java sugar. Since practically the whole of the *gur* now consumed in India is produced in the country internal prices are determined almost entirely by considerations of local supply and demand. A considerable number of consumers prefer *gur* manufactured entirely from Indian cane, mainly on sentimental or semi-religious grounds, and the increase in the duty now proposed will protect this class against the sale of adulterated or imitation *gur*.

Effect of duty on price of Indian *gur*.

86. It may however be urged that the increase in the price of sugar resulting from the imposition of the duty will be reflected in the price of *gur*. The precise relation between the price of sugar and that of *gur* is a matter on which there is apparently considerable divergence of opinion. On the evidence before us we are unable to accept the view that there is any substantial correspondence between variations in the prices of sugar and of *gur*. In view of the great importance of the subject we decided to collect figures of prices of sugar and of *gur* in different parts of the country at different periods and have been at considerable pains to elucidate the tendencies disclosed by these figures. The general conclusion we have arrived at is that such correspondence between the two prices as is established by the figures occurs over long periods or at times of general economic stress, as in the years immediately following the war. In both cases the correlation is the result rather of variations in the general level of prices than of any direct reaction of sugar prices on *gur*. We have examined the prices of other commodities such as cotton over the same periods and the correspondence shown between sugar

Effect of imported sugar prices on *gur* prices.

and *gur* prices is no more striking than between the price of sugar and of other commodities. Over short periods, as a rule, the movements of sugar and *gur* prices show hardly any resemblance. This is significant because it is over short periods, when the effect of changes in the general level of prices is largely eliminated, that the interaction of prices of articles having similar uses should be apparent. One qualification to this proposition which the evidence suggests is in regard to the fall in the price both of sugar and of *gur* which occurs during the crushing season. *Gur* is an article difficult to keep and therefore the large supply available in the market for immediate sale when the manufacturing season is in full swing tends to depress prices. We have been told by one of the principal importers that, when this happens, dealers occasionally reduce the price of sugar in anticipation of a possible decline in the off-take of sugar. Some of the figures we have examined appear to support this suggestion. Apart from this, and subject to minor exceptions to be discussed hereafter, we have found no evidence for the view that there is any necessary relation between the prices of sugar and of *gur*. We have examined several large dealers in *gur* on this subject and are satisfied that our view is supported by trade opinion.

No close relationship established.

87. Since 1922-23, there has been a continuous and uninterrupted fall in the price of sugar in India, while the price of *gur* according to published prices rose substantially both in 1925-26 and 1928-29. There is a class of consumer who for sentimental reasons will prefer *gur* to sugar at whatever level prices may stand. This class is much larger than might be supposed. It does not appear that there has been any wholesale replacement of *gur* by imported sugar. We find in 1909-10 the imports of sugar, refined and unrefined, amounted to about 630,000 tons while in 1930 the figure stood at about 1,000,000 tons. This increase is not alarming when it is remembered that between 1900 and 1909 imports increased from 200,000 to 630,000 tons. The position appears to be that an expansion in the demand is met mainly by imported sugar and that the formation of such habits as tea and coffee drinking and the use of aerated or sweetened waters mainly accounts for the increase. It is true that the price of refining *gur* bears a close relation to that of sugar. This however does not affect the general validity of our conclusion, because the price which the refiner can afford to pay is obviously determined by the price which he can hope to obtain for his refined sugar. Besides, the use of *gur* for refining purposes is so insignificant that its effect on the general prices of *gur* may for practical purposes be disregarded. There may also be some inter-relation of prices in the larger towns, but in the main the price of *gur*, which is often very local and varies very much for the numerous classes of *gur*, depends on the quantity produced. This in turn depends on the climatic conditions of the season and the area under cane. Apart from the effect of climatic conditions on prices and eventually on the area under cane, an examination of the figures indicates fairly

general cycles of rise and fall in acreage, a large output decreasing the price of *gur*, thus discouraging the cultivation of cane and eventually restoring the price. Our conclusions are that the consumption of *gur* is fairly constant and its price depends in the main on production and consequently on the area under cane and on climatic conditions during the year. The increase in the duty is not likely to affect the consumer of *gur* and the price, which is often very local, will continue to be fixed by local conditions of supply and demand.

Duties on sugar in other countries.

88. We come now to the question of the effect of the duty on the consumer of white sugar. It will not be disputed that protection of the sugar industry is essential in the national interest and the only question on which difference of opinion may arise is the degree of protection required. It will be seen from the statement of fiscal measures in other countries set out in Chapter I of this report that practically every country considers the sugar industry of such national importance that great sacrifices are made to ensure its maintenance or expansion. Cane cultivation in India is of at least as much importance as beet cultivation in Europe and India cannot afford to neglect the example of other countries and allow irreparable damage to be inflicted on its agricultural system. For convenience of reference we summarize in the table below the duties in force in the various countries:—

	General duty per cwt.	Remarks.
	s. d.	
Great Britain . . .	11 8	Over 98 per cent. polarisation.
United States . . .	11 8	Raw sugar.
Germany	16 1	White sugar.
South Africa . . .	8 11·5	Includes suspended duty of 3/6 per 100 lbs. now in force. Anti-dumping duties of 8/8 per 100 lbs. are also in force against German and Czechoslovakian sugar.
France	11 10·8	
Austria	12 0	

The duties which we have proposed average approximately 10 shillings per cwt. and in the first seven years amount to just under 11 shillings per cwt. It will be seen therefore that the level of duty now proposed is not higher than that which other countries consider necessary in view of the great importance of the sugar industry. The establishment of a well organised white sugar industry is, as we have pointed out, of at least equal importance in India. The facts set out above show the extent of the burden which other countries have been prepared to bear in view of the national importance of the industry. The white sugar industry is still in its infancy in India, but it may be pointed out that it was under similar conditions that protective duties at a high level were introduced in most of the countries referred to above and in fact in certain countries the duties were introduced with the deliberate intention of bringing the industry into existence.

89. But the question still remains whether if a protective duty is introduced the level of the duty will be such as to bear hardly on consumers or any particular section of the community. In the table below are given the prices in Calcutta, Bombay and Karachi for sugar from different sources for the years 1892-1910. The figures are taken from Notes on Sugar in India by Mr. Noel Paton, late Director of Commercial Intelligence, India. They include the duty at 5 per cent. *ad valorem*. The beet sugar prices between 1899 and 1901 are affected also to some extent by the countervailing duties on imported bounty-fed sugar levied for varying periods against imports from different sources.

Probable prices and pre-war prices compared.

Year.	Beet sugar per cwt.			Cane sugar per cwt.			
				Java sugar.			Mauritius.
	Calcutta.	Bombay.	Karachi.	Calcutta.	Bombay.	Karachi.	Bombay.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1892 .	16 8	...	15 11	...	...	...	17 0
1893 .	19 2	...	18 0	...	...	...	17 7
1894 .	15 8	...	14 6	...	...	...	14 8
1895 .	14 0	...	12 10	...	...	...	13 4
1896 .	15 3	...	14 4	...	...	...	14 4
1897 .	14 6	...	13 4	...	..	...	13 6
1898 .	13 11	14 5	12 9	...	...	...	13 1
1899 .	14 7	15 5	14 1	...	...	...	13 11
1900 .	15 11	16 9	15 2	...	...	...	15 5
1901 .	14 8	14 11	13 11	...	...	..	14 0
1902 .	12 11	12 9	12 2	...	...	...	12 11
1903 .	13 11	14 0	14 4	13 7	14 1	13 8	13 1
1904 .	13 10	13 8	13 11	13 2	14 6	13 9	13 4
1905 .	15 7	16 4	16 0	15 5	16 4	15 9	14 8
1906 .	11 10	12 2	12 0	11 11	13 2	11 8	11 8
1907 .	12 6	12 8	12 9	12 2	13 2	12 6	12 0
1908 .	13 10	13 7	13 7	13 7	14 0	13 3	13 3
1909 .	13 11	14 0	14 2	13 10	14 7	13 8	13 7
1910 .	14 10	16 6	15 7	14 9	15 10	14 11	15 2
Average .	14 7	14 5	14 2	13 7	14 5	13 8	14 0

It will be seen from these figures that the average pre-war price may be taken as 14 shillings a cwt. or at the exchange then prevailing Rs. 10-8 per cwt. The fair selling price which has been proposed in this report is Rs. 8-13-1 a maund or approximately Rs. 12 per cwt. It is relevant to point out that in no year between 1915 and 1929-30 has sugar sold in India at so low a price. Even taking the duty in the first seven years of the protective period at Rs. 7-4 per cwt. the price is not likely to exceed Rs. 12-12 per cwt., a level lower than the average price for any year between 1915 and 1928-29. When it is remembered that in 1921 and 1922 Rs. 32-4 and Rs. 26-4 per cwt. were paid, the level which may be reached under the scheme of protection now put forward does not appear unduly high. Our proposals, therefore, involve no large increase in the price which the consumer has been accustomed to pay.

Indian Taxation Committee and incidence of sugar duty on consumer.

90. The Indian Taxation Committee at page 121 of Volume I of its Report remarks:—

> "The duty chiefly responsible for this (the shifting of the burden of taxation from the richer classes to the general population) appears to be that on sugar which was imposed for the first time in 1894 at 5 per cent. raised to 10 per cent. in 1916, to 15 per cent. in 1921 and is now (1924-25) fixed at 25 per cent. at which figure it yields 14 per cent. of the total customs revenue. It has been stated above that this duty was a good revenue producer and at the same time one in respect of which an element of protection is not undesirable; but it must not be forgotten in noting these facts that it has also the effect of raising the price of country sugar as well as that of imported sugar and thus tends to increase the burden of taxation on the poorest classes who are large consumers of both kinds."

As regards the incidence of the duty on the consumers of sugar the information before us does not entirely support the conclusion arrived at by the Taxation Committee. For it appears that the poorest, namely the agricultural classes, consume little sugar, their requirements in this direction being met by *gur*, while even in the smaller towns *gur* is consumed to a very large extent. There are also indications that imported sugar is used largely by the well-to-do and middle classes, partly because these classes are in process of discarding the prejudice, which is to some extent sentimental, against the use of imported sugar and partly because they are in the habit of consuming tea, coffee and other beverages sweetened with sugar to a far greater extent than is the case with the poorer classes. We have found, and on this point trade opinion supports us, that the price of white sugar is not the determining factor in the price of *gur* and throughout large portions of India the price of *gur* is practically independent of that of imported sugar and is regulated in the main by the character of the season and the

output of cane. It appears, therefore, probable that the burden of the sugar tax falls to a greater extent on the well-to-do classes than the Taxation Committee supposed.

Consumption of sugar by poorer classes.

91. We addressed four local Governments on the subject asking them to institute local enquiries as to the relative consumption of *gur* and sugar in the rural areas and in towns of different types. In reply to this letter, some interesting information has been obtained. The United Provinces Government states definitely the view that the price of *gur* is independent of the price of imported sugar. The Bihar and Orissa Government states as follows:—

> "On the whole it appears that there is a good deal of evidence that *gur* prices are not at all closely linked with sugar prices, and that the burden of the sugar duty is borne mainly by the more well-to-do section of the urban population."

The following table gives the proportion of sugar and *gur* consumed in various areas as returned by various officers of Government whose replies have been forwarded—

Province.	District.	Rural area proportion consumed.		Town proportion consumed.		
		Sugar.	*Gur.*	Sugar.	*Gur.*	
United Provinces	Gorakhpur	1	10	1	1·5	
	Etah	1	·75	1	1	Including deshi sugar.
	Firozabad	...		1	1	
Bihar and Orissa	Manbhum	1	11	7	1	
	Muzaffarpur	1	3	4	1	
Madras	Anantapur	1	8	2	1	
	East Godavari	3	7	1	1	

It will be observed that, though estimates show considerable difference in various parts of the country, the conclusion can be substantiated that very little sugar is used in the agricultural areas (except those parts of the United Provinces where khandsari sugar is made) while in the towns the consumption of sugar exceeds largely that of *gur*. More than one officer expresses the opinion that sugar is mainly used by the well-to-do classes, the middle classes use about half sugar and half *gur* and the poorer classes in the main still use *gur*.

92. Interesting information was received also from the Bombay Government. Figures collected from nine villages in the Poona District varying in distance from 9 to 35 miles from Poona show that the amount of *gur* and sugar consumed stood in the proportion of 1:1·14. The proportion of consumption of sugar to *gur* was found to be much higher in the case of the richer classes and much lower in the case of the poorer villagers; middle class villagers consumed about equal proportions of each. As regards the towns the consumption of sugar is reported to exceed by far that of *gur*. The effect of the tea drinking habit on the consumption of sugar is reflected by figures obtained from hostels attached to educational institutions in Poona where accounts are maintained of goods purchased and used. The figures are given below.

Incidence in Bombay.

——	*Gur* per head per year.	Sugar per head per year.	Remarks.
Boy's Boarding house . . .	20·5	41	Tea consumed.
Girl's Boarding house . . .	11·8	21·1	
Boy's Boarding house . . .	24	8	No tea consumed.
Girl's Boarding house . . .	14·7	3	

93. With a view to testing these conclusions we have examined such literature as is available regarding village economic surveys. In the Economic Survey of Ghaggar Bhana (Amritsar District), Punjab Village Survey series, we find a statement of daily food consumption of 5 families. Of these two are of Jats or landholding families, two oil pressers and one a weaver. In no case is sugar a part of the dietary. In the case of the two Jats, the landholding class, the daily consumption included 6·7 and 9·9 oz. of *gur*, but no *gur* is included in the consumption of the three other families. Since conditions vary very much in different parts of the country it is impossible to arrive at conclusions which can claim to be universally applicable. But on the evidence before us, it appears that the following general conclusions can be substantiated:—

General conclusions.

(1) More sugar than *gur* is consumed in the towns.

(2) More *gur* than sugar is consumed in the villages.

(3) The poorer agriculturist consumes very little sugar.

(4) The proportion of consumption of sugar to *gur* is far greater in the case of the well-to-do than of the poorer classes.

We believe we are justified in assuming therefore that the agriculturists, who are the poorest as well as the largest class in

India, will incur very little if any additional expenditure as a result of the protective duty on sugar. On the other hand the gain which will accrue to agriculture from the extension of white sugar factories, the exclusion of foreign sugar and the prevention of the manufacture of imitation or adulterated *gur*, should far outweigh any disadvantage resulting from an increase in the price of imported sugar above the prevailing low levels. The duty will we believe be borne in the main by the urban population, but even here the incidence of taxation will be higher per head in the case of the well-to-do and middle classes. It may also be pointed out that heretofore, on balance, the burden imposed by the adoption of a system of protection has been borne by the agriculturists for the benefit of the urban industrial population. This is the first occasion on which proposals for protection will be of direct advantage to the rural classes, both agriculturists and labourers, and there is therefore perhaps a rough justice about the proposals which should appeal to the unbiassed observer. Our conclusion regarding the position of the consumer may be summarized as follows. The protective duty now proposed is not in excess of that considered necessary by many other countries in view of the national importance of the industry. Even with the higher rate of duty proposed the level of sugar prices will be lower than that in force in any year between 1915 and 1928 and not more than 20 per cent. in excess of pre-war prices. As will be seen from the figures given in Chapter V, at the end of the period of protection we consider that the price will have fallen to under Rs. 11 per cwt., or practically the pre-war price. At least in the upcountry districts competition may drive prices even below this level. We consider also that, with improvement in cultivating methods and in varieties of cane, a still further reduction in costs will be effected thereafter and it is not unreasonable to suppose that eventually the consumer will obtain the sugar at considerably below the pre-war level. In the towns the incidence of the duty per head will be higher in the case of the richer and middle class consumers who are best able to bear it, while it is not unreasonable to expect that the urban population who have mainly benefited from the adoption of a policy of protection, should in turn be prepared to bear some burden for the benefit of the agricultural classes.

Protection unlikely to affect seriously industries using sugar.

94. In paragraph 3 (*iii*) of our terms of reference we are asked to report how our recommendations will affect industries using any sugarcane products. As regards molasses, we have suggested no alteration in the duty; the distilling or tobacco curing industries are not therefore affected by our proposals. The position of manufacturers of methylated spirit has already been discussed. The largest industry using sugar as its raw material is the confectionery industry. In all branches of this industry imported sugar is largely used. Indian sweetmeats, however, are not in competition with imported confectionery and it

appears that this branch of the trade will not be affected. As regards confectionery of European type manufactured in India, the duty on imported confectionery is already so high, amounting on the average to over Rs. 25 per cwt., that an addition to the duty on imported sugar of Rs. 1-4 per cwt. is not likely to affect this industry. We have received no representation or objection from any branch of this industry and it must be presumed, therefore, that no serious result is anticipated from the grant of protection to the Sugar industry.

CHAPTER VIII.

Other Measures of Assistance.

Expenditure on Research in India.

95. We have stated in paragraph 14 of Chapter VI that the provision of increased sums for development and research work in connection with the sugarcane industry may be regarded as an essential condition to the success of any scheme of protection. It is now necessary to consider in detail this aspect of the case. The expenditure on development and research in connection with sugarcane in India is on a scale which in view of the large acreage under cane and the importance of the crop, may be considered small. The annual cost of the sugarcane Research Station at Coimbatore is under Rs. 1,00,000. The expenditure on the Sugar Bureau at Pusa in the year 1929-30 including a sum of Rs. 5,000 spent on cane experiments, was less than Rs. 40,000. A special grant of Rs. 10 lakhs for the promotion of sugarcane research work was made by the Government of India to the Imperial Council of Agricultural Research; this being a non-recurring grant, the new schemes to be financed by it have been spread over five years, the annual expenditure being thus Rs. 2 lakhs per year. Of this a considerable portion is non-recurring expenditure. It has not been possible to obtain from local Governments details of expenditure on sugarcane research and development, since cane is not the only crop grown on their experimental farms. The Director of Agriculture estimates the expenditure in the United Provinces on cane research and demonstration at Rs. 1,26,000 in 1929, while the Bombay Government gives an expenditure of about Rs. 70,000. As the United Provinces contain about half the sugarcane area in India, it is probably safe to assume that the total provincial expenditure does not exceed Rs. 5 lakhs. Taking Central and Provincial expenditure together it would appear that annually less than Rs. 10 lakhs is spent on sugarcane development and research. On the area under cane in India—some three million acres—the normal expenditure per annum amounts to under 6 annas per acre.

Expenditure in Java and Hawaii.

96. In Java in recent years about Rs. 14 lakhs has been spent annually on the great sugar research station at Pasoeroean. The total area under cane in Java is some 450,000 acres, and the incidence of expenditure on the research station is rather over Rs. 3 per acre. The Pasoeroean station is something more than a research station. The area for experiments available at the station is only some 15 acres, but most of its field work is carried out on sample plots on various estates. There are 3,000 such plots scattered over wide areas so that great variety of soil is available for its tests. The funds for the maintenance of the station are provided by a levy on all estates of 5 guilders per bouw (Rs. 3-3

per acre). The experimental station in Hawaii is operated on similar lines to those prevailing in Java. Funds are provided by a cess on the sugar produced. The total at present contributed in this manner is about £70,000, the cess being 2 shillings per ton of sugar. This works out to not less than Rs. 12 per acre.

Scope of work of Research Institutes in Java and Hawaii.

97. The scope of the work carried on both in Java and Hawaii is thus described by Mr. Noel Deerr—

(*a*) Agricultural;
(*b*) Plant pathology;
(*c*) Entomology;
(*d*) Manufacture;
(*e*) Statistical.

Under Agriculture is included—

(*a*) Soil surveys;
(*b*) Determination of the appropriate fertilisers;
(*c*) Experimental work with fertilisers and different methods of cultivation;
(*d*) Irrigation problems and the determination of the optimum quantity of water;
(*e*) Cane breeding and the examination of newly obtained sexual varieties.

Under plant pathology is included:—

(*a*) The study and means of control of the various fungoid diseases attacking cane.
(*b*) Soil studies connected with such diseases.
(*c*) The quarantining of areas known to be infected with disease.
(*d*) The distribution of immune varieties.

Under entomology is included:—

(*a*) The study of the life histories of insects inimical to the cane.
(*b*) The control of insects mainly by the introduction of their parasites.
(*c*) Quarantine and examination of plants imported from abroad.

Under manufacture is included:—

(*a*) Examination of new manufacturing methods, one particular factory being selected for such examination at the expense of all.
(*b*) Advice on the design and installations of new plant.
(*c*) Consulting work with reference to problems as they arise.
(*d*) Periodic visits to factories to inspect results.
(*e*) Distribution of results obtained in each factory for the mutual benefit of all.

98. In Formosa, where in the course of a relatively short period the Japanese Government has built up a flourishing industry which now enables Japan practically to dispense with imported sugar, a policy of subsidies of various kinds was adopted. In a period of 16 years between 1902 and 1917, the Japanese Government spent 11,178,713 yen or about Rs. 1½ crores on this object. The average expenditure was thus about Rs. 9 lakhs a year giving an incidence on the 300,000 acres under cane of about Rs. 3 per acre. Since 1917 State expenditure has much declined and between 1917 and 1922 did not amount to much more than Re. 1 per acre annually on all objects including irrigation, while at present assistance is limited to the provision of seed, and expenditure on irrigation works.

Expenditure in Formosa.

99. We have given these examples in order to indicate the importance attached in other countries to an adequate programme of research and development and the expenditure considered necessary in those countries for this purpose. The conditions in India differ considerably from those in the countries we have mentioned and the importance attached to the cane crop varies greatly in different parts of the country. The adoption of a scale of expenditure based on an all India acreage rate might therefore not be a suitable method of approaching the problem. But it is recognised now by all authorities on sugar that no real progress is possible for the sugar industry without adequate expenditure on research and development and the description of the functions of the Research Institutes in Java and Hawaii indicates that much remains to be accomplished in this direction in India. What detailed schemes of research should be adopted and what expenditure is required for such schemes it would be beyond the functions of this Board to attempt to set forth. But for the purpose of supporting our proposal that additional sums should be devoted by Government to the encouragement of the Sugar industry it is perhaps necessary to indicate in general terms the direction in which development appears to us possible. In the first place, it appears desirable that financial considerations should not be permitted to retard research work at Coimbatore in connection with thick canes suitable for tropical areas. Already, by concentration of research work on canes suitable for Northern India, provinces such as Madras and Bombay have been placed at a disadvantage in the *gur* market and the possibility of the establishment of the white sugar industry in tropical India depends largely on the future development in regard to the selection and propagation of suitable kinds of cane. Next in importance we should place the trying out of Coimbatore varieties in various soils in the different provinces. For example, in Bombay the soil at the Manjri farm is not at all typical of soils in the important Deccan canal areas. This could be brought about partly by the increase of Government experimental farms, but largely

Additional expenditure on research and development required in India.

also by experiments conducted on plots held by large cultivators or by sugar factories. Such an extension of the work already being done would involve a considerable expansion of the staff to enable any experiments undertaken to be properly supervised and checked. Although this work will to some extent serve the purpose of demonstration, we would class it in the main as research work, and funds should be provided either directly by the Central Government or by grants to provincial Governments through the Imperial Council of Agricultural Research. The results of intensive demonstration work are clearly illustrated by the position in the United Provinces. Here we find that in Rohilkhand and the areas in proximity to the Government farm at Shahjahanpur, the areas under improved types of cane represent from 60 to 80 per cent. of the total area under cane; in the important district of Gorakhpur, where a considerable number of white sugar factories are situated, the area under improved types of cane is only about 25 per cent. of the total area under cane. It has been suggested to us that large grants should be made to Provincial Governments to enable them to undertake development and demonstration work in connection with cane cultivation. But under the present financial arrangements between the Central and Provincial Governments, such grants would not appear to be permissible, since Agriculture is a provincial subject. The exact position of the Imperial Council of Agricultural Research in this respect does not appear to have been decided, but we hope it may be possible to grant some assistance in this direction by means of funds placed at the disposal of this body. Such problems as the improvement of the keeping qualities of *gur*, the manufacture of *gur* of approved quality in central factories and the improvement of types of mill driven by small oil engines also await solution, while the provision of facilities for technical training for Indians both in India and abroad are essential if a rapid increase in the number of factories is to eventuate. Finally, we hope that in Northern India it will be possible as a result of the scheme of protection to organise a strong manufacturer's association providing adequate representation for all the interests concerned, which will be able to take up such problems as the fair distribution of the supplies of cane, the improvement of methods of cultivation, the supply and distribution of improved varieties of cane and the exchange of information regarding manufacture, and will generally assume the position occupied in other countries by central research associations. If such an association is formed, it will be necessary, we believe, in the early years for the Imperial Council of Agricultural Research to contribute to the funds of the Association. Such contribution would of course be dependent on the methods and decisions of the Association and its members being approved by the Imperial Council. We have not been able to obtain from the Imperial Council of Agricultural Research sufficient information to enable us to determine with exactitude the amount which should be devoted annually from Central revenues for the development of sugarcane cultivation and of the sugar industry. Mr. Burt, the Agricultural

Adviser to the Imperial Council of Agricultural Research, in evidence before us stated that not less than 10 lakhs of rupees should be granted annually. From the information supplied by the Imperial Council of Agricultural Research as to the schemes of development and research which they have approved or which are under consideration, it appears also that no smaller sum would suffice. Our recommendation, therefore, is that a grant of not less than Rs. 10 lakhs from Central revenues should be made to meet the purposes which we have indicated and an assurance given that in future years similar grants will be made to meet the expenditure on schemes of research and development and the recurring expenditure on schemes already initiated. In view of the large outlay of public funds involved and the divergence of interests prevailing in the sugar industry we think it desirable that the Imperial Council of Agricultural Research should act in consultation with the Government and the Legislature in constituting the machinery required for carrying out such measures as may be necessary to further the objects we have in view.

Information and returns to be supplied by factories.

100. We consider it important that any Bill which is introduced for the protection of the Sugar industry should contain a clause enabling the Governor General in Council, or such officer as may be authorised by him in this behalf, to call for such returns as he may deem necessary from sugar factories. The Imperial Council of Agricultural Research should be kept fully aware of the progress of the industry. When an industry is supported at the expense of the general public, it is reasonable that the industry should be regarded as a whole and that no information regarding costs should be withheld which could possibly advance the progress of the industry, facilitate research and thereby eventually reduce the cost to the consumer. All such information would be regarded as strictly confidential and used only for the purpose of estimating and co-ordinating the results achieved under the scheme of protection. Where the publication of such results is called for in the interests of the industry as a whole, care should be taken that the names of individual factories are not divulged. We also consider it important that full information should be supplied as to the rates paid by individual factories for cane so that Government may satisfy itself that the cultivator is receiving fair payment and that the benefit of the protective duty is not retained by the factories alone.

Scales of payment for cane.

101. It is clear that no direct measures can be taken to ensure that a definite rate for cane is paid to producers. Conditions differ so widely in India as regards the output of cane per acre, the cost of cultivation and the sucrose content of the cane that no one scale of payment would be suitable to all conditions. As we have shown, any system of bounties is unsuitable to the conditions of this country. But even if a system of bounties could be introduced, we doubt whether the sanction thereby afforded would be

sufficient to ensure that cultivators were always paid according to a predetermined scale. The system of scales of payment for cane based on the price of sugar has been discussed at length in paragraphs 317 to 326 of the Sugar Committee's Report of 1920 and need not be recapitulated here. The conclusion arrived at by the Committee was that in Indian conditions a sliding scale based on a price for cane equal to half the price of the sugar manufactured from it subject to a minimum of 6 annas per maund of cane would be suitable. Taking our present fair selling price at Rs. 9-5-9 per maund on the Sugar Committee's sliding scale the price for cane would work out at approximately 7 annas per maund. With the fair selling price which we have suggested at the end of the period of protection, *viz.*, Rs. 7-12-5 the price would work out at nearly 6 annas per maund of cane. The Committee considered that if any modification of this scale were called for it should be in the direction of greater liberality. We have given our reasons for considering that in the first years of protection a rate of less than 8 annas a maund for cane delivered at factory will not secure that advance in the industry which we consider necessary and the scheme of protection which we have proposed is designed so as to enable factories to pay for cane at this rate. While agreeing generally that the scale put forward by the Sugar Committee of 1920 is suitable for Northern India, we would modify it in the first years of protection to the extent of adding one anna per maund of cane to the calculated price. At the time the Sugar Committee reported the average extraction of Indian factories was 6·85 per cent. against a present average of 9 per cent. and the price of sugar which they took into account in justifying the scale was the pre-war price which is lower than the present fair selling price under our proposals by over Re. 1 per maund. Consequently the payment of an extra price of one anna for cane would still give the factories a larger surplus above the cost of cane than the Sugar Committee calculated. We desire to explain that the scale is put forward for the guidance of factories, since it is in their interest that cane should be purchased at such a price as will induce the cultivator to undertake intensive cultivation of sugarcane in the proximity of the factory. We fear that no system of scaling prices for cane in accordance with the output of sugar will be understood by the ordinary agriculturist though the mere publication of our recommendation may be of advantage to the cultivator of cane on a large scale. Further, even if a scale could be devised which would be suitable for the very varied conditions of cane cultivation in different parts of India, the methods of evasion are so numerous that it is improbable that it could be successfully enforced. From the evidence which we have received it appears to us probable that if protection is granted, a considerable number of factories will be prepared to advance their rates for cane to an average of 8 annas delivered at factory and it is likely that in course of time other factories will follow their example. But we must leave it to the good sense of factory owners and to their realization that eventually the interests of the factory and of the cultivator are inseparably

connected, to ensure adequate payment to the agriculturist for his cane. We consider however that a clause might be inserted in the Bill enabling the Governor General in Council or any authority appointed by him in this behalf to issue rules requiring sugar factories to post in a conspicuous place at the entrance to the factory notices specifying such matters in connection with the rates paid for cane as may be thought fit. It is suggested that such notices might contain a statement of the current rate for cane delivered at factory, the weekly Calcutta price of sugar and a statement of the price per maund of cane worked out on the scale which we have recommended on the basis of the Calcutta price and the previous year's extraction. The correctness of the contents of such notices should be checked from time to time by officers of the Agricultural and Industries Department and since, if our recommendation is accepted, it will be compulsory to make returns of all relevant data to Government, there should be no difficulty in ensuring an efficient check.

Compulsory control of cane cultivation by factories not recommended.

102. While for the protection of the agriculturist scales of payment have been discussed, for the protection of the industrialist the licensing of factories and the fixation of zones of operation have been suggested. The proposal is designed to protect the factory against competition for cane in the areas in its vicinity from distant factories and also to prevent the overcrowding of factories in limited areas of cane. It is sought in this manner to offer inducements to factories to develop cane cultivation in their vicinity, secure in the knowledge that any advantage resulting from improvement in supplies or in quality of cane will be enjoyed by the factory itself. The suggestion is indeed an alternative to what is admittedly the best and most progressive form of cane cultivation, namely cultivation by the factory of land either in its own possession or under its control. We agree with the Sugar Committee of 1920 that save in exceptional circumstances, as when waste or reclaimed land is available, this method of cultivation is impracticable in Indian conditions. The area of land required to supply a factory with an output of 4,000 tons of sugar a year might in Northern India amount to as much as 10,000 acres of land on a three years rotation. Apart from the legal position which is discussed in paragraph 310 of the Sugar Committee's Report, the alienation of large areas of land to which the cultivating classes are attached by sentimental and family ties, would, we are convinced, in modern conditions, wreck the prospects of success of any factory so established. Nor are we in favour of compulsion being introduced to force the cultivator to surrender the control of his land for sugarcane cultivation to the factory. It was suggested in Bombay that provision of water from the canal system might be made dependent on the surrender of a portion of the land to a sugar factory for cane cultivation. The fact that compulsion is indirect will not, in our opinion, detract from the resentment which must inevitable ensue. In fact the system, though suitable for Java for historical reasons, is entirely unsuited

to India where liberty of cultivation is traditional. We would not however be averse to the acquisition of small areas in the vicinity of a factory for set supply and demonstration under the conditions laid down by the Sugar Committee of 1920, but even in this case it would be preferable, if possible, to arrange for such acquisition by private negotiations.

Licensing of factories and zones of operation.

103. The case for the licensing of factories and establishment of zones rests mainly on the argument that some degree of assurance as regards its supplies of cane is essential before a factory will develop and improve the cultivation of cane in its vicinity. So long as it is possible for a new factory to be built in the neighbourhood, an established factory will not spend money on spreading the cultivation of new varieties of cane, improving the quality of sets or arranging for the supply of manure, since the advantages which may accrue from such expenditure, such as cheaper and better cane or larger and more regular supplies, will disappear on the establishment of a rival factory. Competition between factories in restricted areas also tends to push up the price of cane, in extreme cases to uneconomic limits. But apart from this there is a definite loss resulting from uneconomic distribution and the consequent increase in haulage charges. In an interesting note Mr. Noel Deerr (Appendix V) shows that in 1928-29 in the districts of Saran (Bihar and Orissa) and Gorakhpur (United Provinces) 12 factories met the haulage charges for cane over 179,740,000 maund miles. He claims that by an agreed system of allocated areas, this could have been reduced to 108,520,000 maund miles without any diminution of supplies to the various factories. But while it may be agreed that there are undoubted advantages which would accrue to factories by the adoption of a system of licensing coupled with the allocation of definite zones, we feel that it is not a subject on which Government would with advantage introduce legislation of all India application. It would seem that the views of those who advocate this system are coloured too much by conditions prevailing in a restricted area, particularly in the Saran and Gorakhpur districts where numerous factories are situated whose markets for cane overlap. No system of licensing now introduced could reasonably be applied to existing factories and the position of factories in the United Provinces and parts of Bihar and Orissa would not be improved thereby. Further it appears to us that the position has considerably improved since the Sugar Committee reported and, though at certain times of year notably towards the end of the cane season high prices are paid as a result of competition, all factories are able on the whole to obtain adequate supplies of cane. It may be argued that in the future further factories may be established and that the industry thereby may run the risk of collapse. To this we would reply that the conditions of success in the Sugar industry are far better known now than they were a few years ago, and self interest alone should prevent the establishment of factories where supplies of cane are insufficient. Further though it is admitted that in process of

adjustment economic loss may result, it appears probable that by the elimination of the less efficient factories a position of reasonable efficiency in the sugar industry would be restored, even if the most unfavourable forecasts regarding the overcrowding of factories were fulfilled. Competition between factories is the only definite safeguard which the cultivator possesses for the maintenance of cane rates and it would appear inequitable to deprive him by statute of this guarantee unless effective statutory provision could be made for the rates which should be paid for cane. As we have seen any such provision would be extremely difficult to enforce. Generally we feel that the question of the distribution of cane, areas of supply and the fixation of zones is a matter to be determined by the factories concerned and we believe that the problem is not insoluble if, as may be hoped, an effective association of manufacturers comes into being as a result of the introduction of protection. There is one direction however in which some assistance may be afforded. The main requirements for the success of a sugar factory are an adequate and continuous supply of cane of reasonable freshness, a sufficiently long working season and an economic price for cane. If the Director of Agriculture in the Province concerned has an opportunity of advising the promoters of a Sugar company on these points, it appears probable that the danger resulting from the possibility of new factories being established in areas where sufficient factories already exist to utilize the probable output of cane, will be much reduced. We anticipate that promoters of new sugar companies will be anxious to obtain authoritative information on these points and we consider that the Agricultural Departments should keep in touch with developments in this direction and afford all possible assistance.

Investment in Sugar Companies by Government not recommended.

104. One method of assistance to the industry which has been brought to our notice is the taking up by Government of shares in new sugar factories. We are definitely opposed to any such proposal. Apart from the objection to the investment of Government funds in what must be at best a speculative undertaking, it would be difficult to determine in which companies the investment should be made, while established factories would have some reason to complain if they found themselves faced with competition from State-aided rival firms. Further we consider that in an industry so closely connected with agriculture, the relations existing between the agriculturist and Government on the one hand and Government as shareholder and the management of the company on the other hand might leave room for most undesirable misunderstanding. These objections do not apply with the same strength to the issue of loans by Government to sugar companies. Assistance has been granted by the British Government* to sugar interests in various colonies by means of loans

* British Government Publication No. Cmd.-3705 of 1930 "Correspondence relating to the position of the Sugar Industry in certain West Indian Colonies, British Guiana and Mauritius".

carrying easy or no interest and it appears to us that if a good case is made out in any particular instance this precedent might be followed.

Conditions in case of Government concessions.

105. In concluding this report we wish to draw attention once again to the recommendations contained in paragraph 292 of the Fiscal Commission's report. These were embodied in the Steel Protection Act of 1924, the relevant section of which runs as follows:—

> "5. Notwithstanding anything contained in section 3 or section 4, no bounty in respect of steel rails, fishplates or wagons shall be payable to or on behalf of any company, firm or other person not already engaged at the commencement of this Act in the business of manufacturing any one or other of such articles, unless such company, firm or person provides facilities to the satisfaction of the Governor General in Council for the technical training of Indians in the manufacturing processes involved in the business and, in the case of a company, unless
>
> (*a*) it has been formed and registered under the Indian Companies Act, 1913; and
>
> (*b*) it has a share capital the amount of which is expressed in the memorandum of association in rupees; and
>
> (*c*) such proportion of the directors as the Governor General in Council has by general or special order prescribed in this behalf consists of Indians."

It appears to us possible that the objects sought to be brought about by such provisions may be defeated by the registration of sugar companies as private companies. It is reasonable that where an industry is in receipt of assistance which is provided by the community in general that the public should be given an opportunity of sharing in the prosperity of the industry by becoming shareholders. We have noticed that a few of the larger sugar factories are constituted as private companies while others, though registered as public companies, do not fulfil these provisions. We believe such companies would find it to their own interest to identify themselves more closely with Indian interests by taking steps to comply with the conditions to which we have referred. We consider also that new sugar companies coming into existence during the protective period should be registered as public companies with rupee capital. Compliance with these conditions should be secured by such means as Government may consider practicable in the circumstances of the Sugar industry. Though we have not recommended assistance by means of bounties to sugar companies, it appears possible that in the future, as has occasionally occurred in the past, subsidies or loans may be granted to sugar companies either for the development or stabilization of their business or for

research purposes. Further it has been suggested that grants should be made by the Imperial Council of Agricultural Research for development and research work to an approved association of manufacturers in Northern India, while occasions may occur in which Government is prepared to offer facilities to a new company for the acquisition of new land. In making any such grant, subsidy, loan or other concession we would recommend that a condition precedent should be the observance by the company concerned or the members of the Association of the principles laid down in paragraph 292 of the Fiscal Commission's report.

CHAPTER IX.

Summary.

(1) The present depression in the Sugar industry throughout the world has been brought about by an excess of production over consumption and by a large increase in the stocks held by producers in the principal sugar manufacturing countries. This has been accentuated by the restriction of the available free market for sugar consequent on tariff arrangements in various countries.

(2) Steps are now being taken by all large sugar producing countries except Russia to stabilize prices by segregation and restriction of output and by fixing quotas of export.

(3) In Russia the Sugar industry like other industries is in the hands of the State. Production is estimated at about 2 million tons of sugar, and it is not impossible that the policy which may be pursued by the Russian Government may have an important effect on the success or failure of the stabilization scheme.

(4) Prices in India follow generally the course of world prices. Notwithstanding the steady increase in the revenue duty from 5 per cent. in 1916 to Rs. 6 per cwt. in March 1930, the price of sugar in India has been steadily falling. The highest figure reached in 1921 was Rs. 40 and the lowest price touched in the current year was Rs. 7-15-0.

(5) The area under cane in India over a series of years has remained very steady, the average during the last 20 years being 2,840,000 acres.

(6) The main product of sugarcane in India is *gur*, of which between $2\frac{1}{2}$ and 3 million tons are consumed annually.

(7) There are at present 29 factories capable of manufacturing white sugar direct from cane. There are also 14 refineries which manufacture white sugar mainly from *gur*. The total output of white sugar by factories and refineries amounts to about 100,000 tons annually. To this must be added about 200,000 tons manufactured annually by the common indigenous process known as the *bel* method. There has been considerable improvement in the extraction of sugar by this process, since the Indian Sugar Committee (1920), reported, probably as a result of the use of Centrifugals.

(8) There has been a remarkable increase in the efficiency of extraction of Indian factories since the Sugar Committee reported in 1920. At that time the average extraction was 6·85 per cent. which has now improved to about 9 per cent. in Indian factories.

(9) Labour conditions in Indian factories were examined and found satisfactory.

(10) Much progress has been made in the last ten years at the Sugar Research Station at Coimbatore and a number of varieties

of cane have been evolved which are particularly suitable for the sub-tropical conditions in Northern India. It is generally estimated that by the introduction of these canes an increase in output of 50 per cent. can be obtained.

(11) It has not been established that up to the present the import of white sugar has seriously affected the price of *gur* or the acreage under cane.

(12) As a result of recent imports of Java *gur* and the manufacture of imitation *gur* from imported sugar it is found that the position of the *Gur* industry may be threatened.

(13) The imports of white sugar now approximate to a million tons. As compared with pre-war imports this shows an increase of 375,000 tons.

(14) We are satisfied that the three conditions laid down by the Fiscal Commission are fulfilled by the Sugar industry and that a case for protection has been established.

(15) We consider that the agricultural aspect of the case for protection is the most important. It is essential in the national interests that the area under sugarcane should not diminish and that a fresh outlet should be provided for cane by encouraging the expansion of the White Sugar industry. Unless steps are taken to develop the White Sugar industry a disastrous slump in the *gur* market is probable which will seriously affect the agricultural classes, disorganise the agricultural system and involve the abandonment of better cane cultivation in large areas.

(16) The khandsari system of sugar manufacture is of great importance in the Rohilkhand tract of the United Provinces. Both from the point of view of constituting an outlet for cane and also to ensure the position of cultivators of cane in Rohilkhand, it is desirable to secure the continuance of this branch of the industry.

(17) It is recommended that steps should be taken to reduce the cost of production of *gur* particularly in Bombay and Madras by the improvement of methods of cultivation and by the introduction of improved varieties of cane after investigation at the Research Station at Coimbatore.

(18) On a review of the cost of cultivating cane in different provinces and of the level of *gur* prices, we consider that a fair price for sugarcane is 8 annas delivered at factory. By the end of the period of protection this might reasonably be expected to have fallen to 6 annas.

(19) On this basis we estimate that the present fair selling price of white sugar manufactured in a typical factory in India is Rs. 9-5-9 a maund.

(20) At the end of the protective period this fair selling price should have fallen to Rs. 7-12-5 a maund.

(21) The mean between these figures, namely Rs. 8-9-1, subject to adjustment, is taken as a basic fair selling price for Indian sugar during the period of protection.

(22) Since about half the sugar produced in India is of second class quality which fetches on the average about 8 annas a maund less than the best sugar, an adjustment on this account is necessary and the fair selling price must be raised to Rs. 8-13-1 per maund during the protective period.

(23) On an examination of such information as is available regarding the cost of production in Java and with reference to present market conditions we think it probable that under normal conditions the price of imported sugar landed in Calcutta would be Rs. 4 a maund.

(24) Prices have however touched as low a figure as about Rs. 3-8-0 per maund landed at Calcutta *ex*-duty and it appears to us not unlikely that in circumstances of exceptional competition or for special reasons Java manufacturers might be prepared to land their sugar in Calcutta at as low a figure as Rs. 3-4-0 per maund.

(25) Taking the fair selling price at Rs. 8-13-1 and the normal landed price at Rs. 4, the measure of protection required throughout the protective period is Rs. 4-13-1 per maund or Rs. 6-9-3 per cwt.

(26) Any scheme of bounties is on administrative grounds impracticable. If khandsari manufacturers were included in the scheme, it would be impossible to devise machinery for assessing and checking the bounty. If the khandsari industry were excluded from the scheme, central sugar factories would be given an unfair advantage over this branch of the industry.

(27) We propose therefore that the assistance given should be by way of duty. In order to enable the industry to face initial difficulties and to safeguard the position of the manufacturer of indigenous sugar by the *bel* method in Rohilkhand we propose that for the first seven years the duty should be fixed at Rs. 7-4-0 per cwt. and for the remaining period at Rs. 6-4-0 per cwt. The total protection thus granted would be approximately the same as would result from the imposition of a duty of Rs. 6-9-3 for the whole period of protection.

(28) We recommend that the period of protection should be for 15 years.

(29) Since agreement regarding export quotas appears to have been arrived at by the leading sugar producing countries, we have with some hesitation decided to recommend no further immediate increase in duty beyond the protective duty already recommended. We recommend that should the present international negotiations for stabilisation of prices fail or should market prices in Calcutta in the future fall below Rs. 4 without duty, a further duty of 8 annas per cwt. should immediately be imposed.

(30) It is suggested that power to impose this duty should be vested in the Governor General in Council but that subsequent to the imposition of such duty sanction of the Legislature should be obtained for the continuance of the deferred duty and for the fixation of the period for which it is to be in force.

(31) We propose that the duties should apply to all classes of sugar including sugarcandy.

(32) We have no recommendation to make regarding the application of Messrs. Carew and Company for the removal of tariff inequality on methylated spirit consequent on the present duty on molasses. The application has now been withdrawn since even if the duty was completely removed, the manufacture of methylated spirit in India would not at the present price of molasses be economically possible.

(33) It is unlikely that the duty imposed on imported *gur* and inferior sugar will have any effect on the price of Indian *gur* which is at present mainly determined by local supply and demand.

(34) It appears also that *gur* prices are but little affected by the price of imported sugar and it is unlikely that the imposition of a duty on sugar at the level proposed will affect *gur* prices.

(35) The level of duty now proposed is not higher than that which other countries consider necessary in view of the great importance of the sugar industry.

(36) The price which is expected to result from the proposed duty is not much in excess of the pre-war price and is less than the price at which sugar has been sold in India in any year between 1915 and 1928.

(37) Since sugar is consumed mainly in urban areas and the price of *gur* will be hardly affected by the duty, it is probable that the agricultural classes will incur very little if any additional expenditure as a result of the protective duty on sugar.

(38) Protection is unlikely to affect seriously the industries using sugar.

(39) Expenditure on development and research in connection with sugarcane in India is on a scale which in view of the importance of the sugarcane crop may be considered small, particularly when compared to expenditure in such countries as Java and Hawaii. We propose that increased sums should be allotted to development and research work since without such measures the whole purpose of the protective scheme is likely to be delayed if not defeated. Indeed we regard this as almost a condition precedent to protection.

(40) We would recommend a grant of not less than Rs. 10 lakhs annually to the Imperial Council of Agricultural Research for this purpose. If our scheme of protection is accepted we consider that legislation should be introduced making it compulsory for sugar factories to submit such returns or information as may be called for by the Governor General in Council or any officer authorised by him in this behalf.

(41) We consider that the scale for cane payment recommended by the Indian Sugar Committee, namely a sliding scale based on price for cane equal to half the price of sugar manufactured from it subject to a minimum of 6 annas per maund is generally

suitable. But in the first years of protection we consider that this should be increased by one anna per maund.

(42) We would recommend that power should be taken to enable the Governor General in Council or any authority authorised by him in this behalf to issue rules requiring sugar factories to post in a conspicuous place at the entrance to the factories notices specifying such matters in connection with rates paid for cane as may be thought fit.

(43) We agree with the Sugar Committee in considering that any attempt to force cultivators to surrender control over land to sugar factories is undesirable.

(44) Nor do we consider that there are sufficient reasons for introducing a system of licensing of factories and definite zones of operation for each factory.

(45) We do not recommend investment by Government in shares in sugar companies but we would have no objection to the grant of loans by Government should this form of assistance appear desirable in any particular instance.

(46) Attention is drawn to the recommendations contained in paragraph 292 of the Fiscal Commission's Report. We consider that if the industry is declared protected, steps should be taken as early as possible to ensure that the conditions suggested by the Fiscal Commission are fulfilled by companies engaged in Sugar industry.

(47) Fair representation of Indian interests on the Directorate and opportunity for Indian investors to subscribe to the share capital of new companies should be secured by such means as Government may consider practicable in the circumstances of the Sugar industry.

(48) We would suggest that no loan, grant, subsidy or other facility should be offered to any sugar factory which has not complied with these conditions.

A. E. MATHIAS,
President.

J. MATTHAI,
Member.

FAZAL IBRAHIM RAHIMTOOLA,
Member.

G. S. BOZMAN,
Secretary.

Bombay, the 29th January, 1931.

APPENDIX I.

White Sugar Factories actually working in India at present.

A.—FACTORIES THAT WORK WITH CANE ALONE.

Bihar and Orissa.

Japaha Sugar Factory.
Pursa Sugar Factory.
Ganga Deshi Sugar Factory.
Lohat Sugar Factory.

United Provinces.

Bubnowlie Sugar Factory.
Mahalakshmi Sugar Factory.

Madras.

Aska Sugar Factory.

Bombay.

Belapur Sugar Factory.
Hanuman Sugar and Oil Factory.

Total . 9 factories.

B.—FACTORIES THAT WORK WITH CANE AND ALSO AS REFINERIES.

Bihar and Orissa.

Champaran Sugar Factory.
Ryam Sugar Factory.
Marhowrah Sugar Factory.
Pachrukhi Sugar Factory.
New Savan Sugar Factory.
Samastipur Sugar Factory.
Maharajganj Sugar Factory.

United Provinces.

Gauri Sugar Factory.
Padrauna Sugar Factory.
Noori Sugar Factory.
Purtalpore Sugar Factory.
Rosa Sugar Factory.

B.—FACTORIES THAT WORK WITH CANE AND ALSO AS REFINERIES—*contd.*

United Provinces—contd.

L. H. Brothers' Sugar Factory (2 factories).
Sardarnagar Sugar Factory.
Ghugli Sugar Factory.
Basti Sugar Factory.
Lakshmiganj Sugar Factory.

Madras.

Samalkote Sugar Factory.
Nellikuppam Sugar Factory.

Total . 20 factories.

C.—REFINERIES ONLY.

Bihar and Orissa.

Siwan Deshi Sugar Factory.
Sitamarhi Sugar Factory.

United Provinces.

Tribeni Deshi Sugar Factory.
Lucknow Sugar Factory.
Umai Indrani Sugar Factory.
Cawnpore Sugar Factory.
Baijnath Balmukund Sugar Factory.
Unao Sugar Factory.
Srikrishna Deshi Sugar Factory.

Madras.

Al. Vr. St. Sugar Mill.
Sriram Sugar Works.
Travancore Sugar Limited.

Punjab.

Harkishan Sugar Mills.
Amritsar Sugar Mills.

Total . 14 refineries.

APPENDIX II.

Note by Mr. G. R. Hilson, Director of Agriculture, Madras.

PADDY.

The future of this crop, in this Presidency, calls for careful consideration.

There has been a general fall in the price of rice in all the world's markets. The price of Rangoon rice on the London market, for example, between 1926 and the present date has fallen from 15*s.* 4*d.* to 13*s.* per cwt. It is therefore not a temporary fluctuation we are witnessing. It is a permanent drop which so far as can be seen is likely to continue further.

At the present time in this Presidency, the price of paddy is about 30 lb. per rupee, at which price there is little or no profit in the crop.

It does not seem likely that prices will improve in the near future. In all the rice growing countries, the tendency is to extend the area and to try and improve the yield per acre. Particularly is this the case in those countries which are importing as well as producing countries, Java, Ceylon and Japan for example, not to mention our own province and other provinces in India. Japan has in fact progressed so well with her programme that she is now checking import. Australia which might have proved a limited outlet for the East has raised her import duties on rice and paddy and actually contemplates export to the East. America appears to be encroaching on India's share of the Cuba market. Italy, Spain and America are all more advantageously placed in relation to the English and Continental markets than is India. So much for the general position.

In this Presidency there are several factors working towards over production. There is first of all the Agricultural Department with its steady campaign for reducing the seed-rate used for sowing seed-beds, for enlarging the area under heavier yielding strains and for extending the use of green manure crops coupled with an application of phosphatic manures. The first of these items besides reducing the amount of paddy consumed usually results in a slightly higher yield. The second brings about an increase of from 10 to 20 per cent. and the third gives increases up to 25 per cent. if the continued application is persisted in. The cumulative effect of all these factors is likely to increase the average yield to about 18 cwts. per acre.

Secondly, the educated Madrasi is wakening up to the fact that he is better off from a health point of view if he reduces his consumption of rice and replaces it by fruit and wheat or ragi.

Thirdly, large increases in area, amounting to more than half-a-million acres, are contemplated in the very near future. This is one side of the picture. At the last census in 1921, the population of Madras Presidency was under 43 millions. It must now be about 46 millions. I estimate that about 40 per cent. of the people of this Presidency are rice-eaters, and that the average consumption of rice per head per day is 1¼ lb. or 4 cwts. per annum. On this basis, the total quantity of rice required is 3·7 million tons.

During the last three years the average acreage under paddy in the Presidency has amounted to 11·3 million acres and the average yield per acre to 14 cwts. of paddy. In storage this 14 cwts. will lose 7 per cent. or 1 cwt. and of what is left 1 cwt. will have to be set aside for seed purposes. There will therefore be left for consumption 12 cwts. The proportion of rice to paddy is about 2:3. The rice equivalent of 12 cwts. of paddy is therefore 8 cwts. This figure we may take as the average yield of consumable rice per acre. The total production of such rice is therefore 4·5 million tons. Consumption therefore lags behind production. If we allow that 50

per cent. instead of 40 per cent. of the population are rice eaters then production and consumption are about equal.

Examining next the figures for export and import by sea, for the same period, it is seen that there is a balance in favour of imports of 345,000 tons of rice. A large proportion of this is consumed by people who prefer the coarser Burma rice to the finer Madras rice and by others who while they would prefer to eat the finer Madras rice find that the lower price of the Burma product suits their pockets better. Against this import if there is no accumulation of stocks on which point my information is not satisfactory, must be set export by rail and by road, and consumption in feeding elephants and for ceremonial purposes, *e.g.*, weddings, funerals, feeding of ants and feeding of cattle at Pongal, etc., on which items we have no readily available information. This is the other side of the Presidency picture.

It does not offer much hope for expansion of production. For supposing that out of this 345,000 tons, 300,000 actually remained in the Presidency, which is unlikely, any one of the three factors I have already mentioned or a good season will bring about an increase in production within the Presidency of more than that amount. The first two will do it gradually and allow time for adjustments, the last two factors will do it abruptly and will cause dislocation.

One thing is certain however, whichever way it is done, if this quantity of rice now imported into the country is produced in the country and there is no corresponding decrease somewhere else there will be an extra 300,000 tons of rice for which a market will have to be found. If it is produced at a price which will enable it to compete with Burma or Bengal rice, which is unlikely, then this outside rice will have to seek a market, if not, as is more likely the Madras rice will have to find a market. In either case, there will be a reduction in price.

This leads us to the next point. In a struggle for markets, what chance has Madras rice of being able to compete successfully with other Indian rices? From the table given below it will be seen that Madras is the least favourably situated of all the Provinces for this purpose.

Rice—Area, 1927-28.

Province.	Total acreage.	Irrigated.
Madras . . .	10,900,000	7,600,000=70%
Bombay . . .	3,200,000	1,300,000=40%
Bengal . . .	18,700,000	1,200,000= 6%
United Provinces .	7,300,000	500,000= 7%
Burma . . .	12,400,000	1,400,000=11%
Bihar and Orissa . .	13,500,000	3,500,000=26%
Central Provinces and Berar . . .	5,400,000	1,000,000=18%
Assam . . .	4,200,000	600,000=14%

In Madras, 70 per cent. of the paddy grown is irrigated, that is to say, it has to meet a charge for water either in the form of water rate or as cost of lifting. Bengal and Burma, the two chief exporting provinces are both very much more favourably situated as most of their paddy is rainfed.

At the present moment the Tanjore cultivators are bemoaning their inability to find a market and are complaining that Government were ready enough to take advantage of the period of high prices to raise their assessment but are not so ready to lend a helping hand now that prices have fallen. What they will say when they find the produce of an additional 600,000 acres helping to increase their difficulties can be imagined. Their grumble is of course not justified. They asked for water in order to grow paddy. They got it. That point apart, we have here a very clear indication, I think, of what the future has in store for us.

What then is to be done? This is a question that many cultivators are asking and some have answered. The majority as yet do not believe that there is anything to do but wait. Confronted by a similar state of affairs the arable farmers of England laid their land down to grass and changed their style of farming. Similarly, the paddy cultivators of this Presidency, will have to make a change and grow other crops than paddy. This is the only solution we can offer, it is the solution some of them have found, it is the course to which the others will be driven. It is here that trouble will arise, for the crops that will have to be grown in place of paddy, not only do not require so much water as paddy but do require better conditions of drainage. Irrigation works designed for example to supply water in two seasons, will find themselves with a surplus of water in the second crop season and no means of getting rid of it except by letting it run to waste. If therefore my view of the situation is fairly accurate it would seem advisable to begin to take action now and give a lead rather than to wait until the majority of cultivators who can change find that they must do so or cease to farm, and begin to raise a clamour.

It may be argued that the natural increase in population will be sufficient to keep pace with the increased production of rice. This however assumes that the increased population will be in a position to buy rice, that in fact they will be employed. In the absence of any signs of increasing industrial activity of any magnitude in this Presidency, and in view of the present outcry about unemployment and the need for cottage industries this does not seem to me a very hopeful solution of the problem. It ignores the fact that Burma can undersell Madras in the rice market and that a rise in population without a corresponding increase in ability to employ more workers will lead to a demand for cheap rice of which Burma and not Madras would get the benefit. It also ignores the fact that while there is room for industrial expansion the majority of the people of this Presidency must always depend on agriculture for their livelihood and that an expansion of the area under paddy is not the best way to provide agricultural employment.

There is however another aspect from which the situation may be viewed. In those provinces in which the bulk of the paddy grown is rainfed, conditions are such that it is impossible or not readily possible to change to other crops. Moreover other conditions cause these areas to be much less favourably placed than is Madras for growing certain crops which are much more valuable than paddy. In Madras on much of the paddy growing area, it is possible to change. Conditions in Madras are moreover very favourable for the growing of crops like sugarcane, plantains, groundnuts, cambodia cotton, etc. We can grow as heavy crops of sugarcane as any other province and heavier than most. We have the best conditions for growing groundnuts and cambodia cotton and have the largest area of all the provinces under these crops. India supplies the world with castor seed and oil, and Madras grows the largest area of this crop. Our cattle are good and need only a little more attention to feeding and breeding to make them very much better. We have excellent conditions for growing fodder crops. We have very good conditions for growing plantains, orchard fruits, and vegetables. Tomatoes can be grown with the greatest ease. We can grow excellent crops of sunhemp for fibre, for which there is a market in England.

Poultry, eggs, milk, working bullocks, stock for export, sugarcane, plantains, betel-vine, groundnuts, cambodia cotton, gingelly, castor, sunhemp for fodder and for fibre, chillies, and turmeric, tobacco, onions, tomatoes, brinjals, mangoes, limes, oranges, ragi, cumbu, cholam and pulses of all kinds give a wide enough choice to enable any one who desired to do so to decide how he may cut out one or all of his paddy crops.

Incidentally these crops form the basis of subsidiary industries which will produce employment for those not needed on the land and at the same

time can be so used that they will provide work all the year round on the land and for a greater number of people.

To my mind we do ourselves a disservice by not taking advantage of the fact that these other provinces and countries must grow paddy and by not assisting them to do so at a reasonable profit while we make use of our land to better purpose and we do them a disservice by insisting on growing paddy and so helping to glut the market from which they cannot escape but we can.

I do not visualize a complete cessation of the growth of paddy. In some parts of the Presidency conditions are such that paddy is the only crop which can be grown. I do however visualize a limitation of the paddy crop to one season in the year, the wettest, in order to avoid the heavy loss which now occurs from insect pests and so raises the cost of production and in order to make room for the more profitable crops I have mentioned, a change in the methods of cultivation in order to reduce the cost of production, a reduction in the amount of water used for the crop in order not to interfere with the more profitable long term crops which will have to be grown alongside paddy, a cessation of the practice of lowering the level of paddy fields at intervals and the adoption of the opposite practice of raising the level of fields by the application of silt from tanks and channels in order to improve drainage conditions during the wet months.

APPENDIX III.

Abstract estimate for a Sugar cane factory with a capacity of 13,00,000 mds. of cane per season.

		Rs.	Rs.
1.	Site		17,000
2.	Railway Sidings		25,000
3.	F.o.b. cost of plant £52,000	6,76,000	
	Ocean freight, insurance and duty at 20 per cent.	1,35,000	
	Inland railway freight at Re. 1 per maund	35,000	
	Erection of plant	40,000	
	Workshop tools	12,000	8,98,000
4.	Factory boundary wall		10,000
5.	Stores	6,254	
	Clarification house (90′ × 46′ × 34′) and (35′ × 46′ × 52′).	13,206	
	Mill house (101′ × 52′ × 28′)	15,397	
	Boiler house (92′ × 64′ × 32′) 6,548		
	Installing boilers, *i.e.*, foundations, brickwork, etc. 13,594		
	Installing one Lancashire boiler 1,839		
	Flues 1,492		
		23,473	
	Chimney (140′ × 7′ 6″) octagonal	9,066	
	Power house (72′ × 39′ × 21′)	6,236	
	Pan house (125′ × 55′ × 52′)	15,084	
	Sugar house (60′ × 55′ × 34′)	9,074	
	Workshop (101′ × 26′ × 22′)	2,723	
	Spray pond (92′ × 86′ × 3′ deep)	2,496	
	Office and Laboratory	18,500	
	Latrines	3,000	
	Drainage	7,500	1,32,009
6.	Sugar godown (450′ × 50′ × 15′)	44,194	
	Oil godown (40′ × 15′ × 10′)	1,865	46,059
7.	Manager's bungalow	16,500	
	Assistant's half semi-detached bungalow	12,000	
	Bungalow godowns (two)	1,500	
	Bungalow outhouses	4,000	
	Garages (two)	1,500	35,500
8.	Clerks' quarters (12 double sets 12′ × 12′)	40,000	
	Workmen's quarters (40 sets) 10′ × 10′	36,000	
	Watchmen's quarters (12 sets) 10′ × 10′	11,000	
	Laboratory equipment	5,000	
	Office and Bungalow furniture	10,000	
	Electric equipment, *i.e.*, wiring of factory and bungalows	7,500	1,09,500
9.	Tube well		10,000
10.	Weighbridge		15,000
11.	Cart scales		5,000
12.	Locomotive		15,000
13.	Storage trucks for cane		10,000
14.	Molasses storage tanks		25,000
	Total		13,53,068

APPENDIX IV.

Note by Mr. Noel Deerr on Java costs of production.

Estimated cost of production of white sugar in Java by the carbonatation process under the best possible economic conditions.

This estimate is based on data collected when in Java, on various publications up to 1927 and is corrected for recent developments in that island.

The data accepted are—

Acreage	2,750
Maunds cane per acre . .	1,750
Total production of cane .	48,00,000 maunds.
Maunds sugar per acre .	218
Maunds sugar made . .	6,00,000
Maunds molasses made . .	1,60,000
Sugar, per cent., cane . .	12·5 per cent.
Molasses, per cent., cane .	2·9 per cent.
Value of molasses . . .	Re. 1 per maund.

In accordance with general practice in sugar house accounting the value of the molasses is deducted from the cost of production of sugar. The attention of the Tariff Board is called to the following very essential points of difference under which the Indian industry as it is at present constituted is handicapped:—

(1) Larger capacity of factories in Java affecting items such as salaries, labour, new parts, repairs and many items of supplies. As regards the cost of machinery generally, a general rule is cost varies as $\sqrt[3]{c^2}$, where c is the capacity of the unit, *i.e.*, spare parts for an engine of 200 h.p. will, when compared with an engine of 100 h.p. cost $\sqrt[3]{2^2}$ $\overline{4}$=1·59.

(2) The very low comparative cost for limestone in Java factories due mainly to the propinquity of Java factories to source of supply, the superior quality of the limestone and the superior quality of Java cane, the last two factors combined reducing the quantity required to half what is required in Indian factories. The less quantity of limestone used also reduces the cost of another large item, the press cloth.

(3) The groups of Java factories under centralised control being much larger than any group in India administration or head office charges must be much less.

(4) Marketing under one organization also reduced brokerage and similar charges.

(5) The relatively low cost of Java cane and its high value, the first being due to mass production combined with intensive cultivation and fifty years intensive research and the latter also including favourable conditions of climate.

EXHIBIT A.

Total cost, cost per acre, cost per 100 mds. cane, cost per 100 mds. sugar as estimated for best economic conditions in Java.

	Rs.	Rs. per acre.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Cane	8,50,000	309	17·72	141·7
Manufacture . .	4,50,000	164	9·38	75·0
Administration . .	1,20,000	44	2·50	20·0
Sundries . . .	1,50,000	55	3·13	25·0
Total .	15,70,000	572	32·73	261·7
Deduct Molasses .	1,40,000	51	2·91	23·3
Nett .	14,30,000	521	29·82	238·4
Rail in Java . .	1,25,000	—	—	18·7
Port charges Java .	75,000	—	—	12·5
Freight Calcutta . .	1,25,000	—	—	18·7
Port charges Calcutta .	1,25,000	—	—	12·5
Total c.i.f. Calcutta .	18,80,000	—	—	300·8
Add duty . . .	26,25,000	—	—	437·5
Total c.i.f.d. Calcutta .	45,05,000	—	—	738·3

EXHIBIT B.

Detail of cost of cane in Java.

	Rs.	Rs. per acre.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Salaries . . .	50,000	18·2	1·04	8·3
Labour . . .	3,00,000	109·0	6·25	50·0
Rent . . .	1,00,000	36·4	2·08	16·6
Supplies . . .	4,00,000	145·4	8·35	66·8
Total .	8,50,000	309·0	17·72	141·7

EXHIBIT C.

Detail of cane labour.

	Rs.	Rs. per acre.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Cultivation . .	1,35,000	49·0	2·81	22·5
Manuring . .	15,000	5·5	·31	2·5
Irrigation . .	45,000	16·4	·94	7·5
Cutting and loading.	75,000	27·2	1·57	12·6
Transport . .	30,000	10·9	·62	4·9
Total .	3,00,000	109·0	6·25	50·0

EXHIBIT D.

Detail of cost of cane supplies.

	Rs.	Rs. per acre.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Seed cane . .	30,000	10·9	·62	5·0
Irrigation . .	75,000	7·2	1·56	12·5
Cultivation . .	60,000	21·9	1·25	10·0
Manures . .	1,25,000	45·4	2·62	20·8
Transport . .	1,10,000	40·0	2·30	18·5
Total .	4,00,000	145·4	8·35	66·8

EXHIBIT E.

Detail of cost of manufacture.

	Rs.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Salaries	50,000	1·04	8·3
Labour	65,000	1·36	10·9
Supplies	3,35,000	6·98	55·8
Total .	4,55,000	9·38	75·0

EXHIBIT F.

Detail of labour in manufacture.

Operating Season . . . . . 1,000 units of labour per day at 120 days and at 8 annas per day= Rs. 60,000.

Silent Season . . . . . 50 units of labour per day at 200 days and at 8 annas per day=Rs. 5,000.

EXHIBIT G.

Detail of manufacturing supplies.

	Rs.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar
Bags	1,35,000	2·81	22·5
Fuel	5,000	·10	·8
Limestone	35,000	·73	5·8
Coke	7,500	·16	1·3
Press cloth	25,000	·52	4·2
Sulphur	2,500	·05	·4
Oil	12,500	·26	2·1
General Engineering stores	30,000	·62	5·0
New parts and repairs to machinery	82,500	1·72	13·8
Total	3,35,000	6·96	55·9

EXHIBIT H.

Detail of salaries for manufacture.

	Rs.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Manager	12,000	·25	2·00
Chief Engineer	8,000	·16	1·28
Chief Chemist	8,000	·16	1·28
Four assistants	12,000	·25	2·00
Superior Javanese on permanent pay roll	10,000	·21	1·68
Total	50,000	1·03	8·24

EXHIBIT I.

Detail of Sundries.

	Rs.	Rs. per 100 Mds. cane.	Rs. per 100 Mds. sugar.
Insurance	15,000	·31	2·50
Brokerage	25,000	·52	4·17
Experiment Station	10,000	·21	1·67
Advisory staff	20,000	·42	3·33
Repairs houses and buildings	20,000	·42	3·33
Taxes	60,000	1·25	10·00
Total	1,50,000	3·13	25·00

APPENDIX V.

Note by Mr. Noel Deerr on the Zone System or a topical basis of cane distribution.

During the season 1928-29 there were 12 factories operating west of the Great Gandak in the districts of Saran (Bihar and Orissa) and Gorakhpur (U. P.). These factories in all milled 12,163,637 maunds of cane of which 6,322,537 maunds were carried by rail. These were operated by the 12 factories, 216 weighbridges and the total haul of cane was 179,740,000 maund miles. By means of a mutual system the whole of this cane could have been reduced to 108,520,000 maund miles.

In Exhibit I are given the actual conditions which obtained during crop 1928-29. Exhibit II shows how by a system of allocating the nearby cane to each factory and avoiding hauling cane past factories the same quantity could have been supplied to each factory. As an eaxmple Lakshmiganj factory would have been allocated 211,086 maunds from Khada dividing the supplies here (473,101 maunds) with Ghughli, the whole supply from Siswa Bazaar 173,545 maunds and 46,302 maunds from Captainganj dividing the supplies here (82,077) with Padrauna factory. They would have operated three weighbridges and had a total haul of 1,084,000 maund miles, drawing cane from the nearest stations.

Actually this factory operated 17 weighbridges widely scattered and had a total haul of 1,351,000 maund miles.

The totals in Exhibits I and II are not the same and this is due to small differences, the labour in reconciliation of which would have been great.

EXHIBIT I.

Actual number weighbridges operated and maund miles, etc., hauled by factories operating in Saran and Gorakhpore.

	Weigh-bridges.	Rail cane.	Md. mile ×10,000	Average haul mile.
Basti	28	2,12,452	795	37
Bhatni . . .	38	9,10,671	2,825	31
Gauri Bazar . .	14	2,92,300	952	33
Ghughli . . .	8	5,11,601	880	17
Lakshmiganj . .	17	5,16,827	1,351	26
Marhowrah . . .	12	2,94,217	1,392	47
Pachrukhi . . .	30	12,14,972	4,090	32
Padrauna . . .	5	4,69,926	771	16
Purtabpore . . .	3	1,07,440	130	12
Saraya . . .	21	4,53,805	1,518	33
Sewan . . .	23	5,03,782	1,484	30
Tamkohi . . .	17	8,13,993	1,786	22
Total .	216	63,01,986	17,974	29

EXHIBIT II.

Optimum number of weighbridges, etc., for factories operating in Saran and Gorakhpore on a topical basis of distribution.

	Weigh-bridges.	Rail cane.	Md. mile ×10,000	Average haul mile.
Basti	15	2,17,175	553	24
Bhatni . . .	13	9,10,671	1,071	12
Gauri Bazar . .	3	2,92,300	195	7
Ghughli . . .	1	5,11,601	899	18
Lakshmiganj . .	3	5,16,827	1,084	25
Marhowrah . . .	8	2,77,538	770	29
Pachrukhi . . .	8	12,14,972	3,175	25
Padrauna . . .	1	4,69,926	348	9
Purtabpore . . .	2	1,07,440	86	8
Saraya . . .	8	4,53,805	1,087	24
Sewan . . .	3	5,03,872	529	10
Tamkohi . . .	4	8,13,993	1,075	13
Total .	69	62,90,120	10,852	17

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